# The Builder.

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*Concrete Buildings.*

SOME time ago we alluded to the erection of a large and lofty warehouse wholly of concrete, in Great Guildford-street, Southwark. We have recently visited it, and find it standing remarkably well. It was built by the owner, Mr. H. Goodwin, Mr. E. l'Anson being the architect. Mr. Goodwin, who is laying himself out to execute other buildings in this material, has given us some particulars of the work, which may be usefully printed:—

At your request I will as briefly as possible give you an account of the concrete warehouse in Great Guildford-street, built by me. In the first place, the concrete is composed of one part of best Portland cement to seven parts of material consisting of clean Thames gravel, crushed slag and clinkers from furnaces, crushed bricks, stone chippings, oyster-shells, pottery, hard core from dust-yards, and any other hard and incombustible material I could get. After waiting *twelve months* for the Metropolitan Board of Works to consider whether or not Portland cement concrete was applicable to building purposes, I at last got consent to proceed with the work. We built upon an average per day about 12 in. all round the walls, grouting in with sand and cement at every fresh layer of concrete. We also put in hoop-iron bond at each floor. We could have built 18 in. per day, which is the depth of the apparatus, but I considered 12 in. quite fast enough for a building so high; though at other smaller jobs I have often built 3 ft. per day. The building is 70 ft. by 50 ft., and 60 ft. high. It consists of basement and five floors, each floor supported by twelve iron columns. The roof is of concrete 3 in. thick, laid between tee-iron 3 ft. 6 in. apart, covered with asphalte. The thickness of walls is to the brick rule; those 70 ft., two floors 27 in., two floors 22 in., and two floors 18 in.; the 50-ft. walls are, two floors 22 in., and four floors 18 in. The cost of the walls, considering I got a great deal of the material for nothing, was under 6*l.* per rod; or, take the whole of the building as a cube, the cost was about 3d. per foot. It is very strongly built, and as good as one of the warehouse class can be. It is now loaded with goods, every floor full, and has never shown the slightest crack or settlement. It is harder than most kinds of stone used for building purposes, and is of one solid mass from beginning to end. While in course of construction I was honoured by visits from many members of Parliament, most of the members of the building profession, and many other gentlemen, who took great interest in this great test and experiment in building, as well as by yourself. Thanks for your good remarks in the *Builder* at that time.

As with Mr. Tall's patent apparatus (with which it was built) a perfect surface is obtained throughout, it requires only a thin coat of cement and sand to finish the walls perfectly smooth and true. I quite agree with Mr. l'Anson in his opinion "that the success of such work depends on the entire honesty of the man who does it."

I have learnt so much of concrete with this and other contracts I have taken since, that I find the greatest care must be used in choosing the material. I have made specimens of all kinds. Many persons, and amongst them builders, think if they have gravel, by adding the cement they have all that is required to make concrete. So much depends upon the gravel, that if it is not the right sort the work will cost as much as brickwork, and then never be sound. Every bit of loamy matter and dirt must be washed out thoroughly; then you must replace with clean sharp sand, about one-fourth.

Those who wish to build of concrete should only do so where the material is on the spot or very near. Clean river ballast, with a good proportion of sand, is as good a thing as we can have for Portland cement concrete. If some crushed slag or furnace clinkers can be mixed, so much the better; it is also lighter, which is a good thing in wall construction. Burnt clay is also a very good material, provided it is well burnt. Great care should be taken to sift with a fine sieve all crushed material; for, let it be what it may, dust, loamy matter, or fine sand, if it is finer than the cement itself it will dilute and kill it. I have made specimens of concrete with gravel that have become as hard as the best stock brick, and I have made others, with the same proportion of cement, that you may crush and crumble in your hands. There is much gravel in some parts of Surrey, all small round stones free from loam, but containing a very fine sharp sand. Many would think it good for concrete; but use it, and take whatever care you please, the concrete will be little better than if you had only mixed it with water; the reason is, the sand being finer than the cement, kills it.

The concrete chapel I have just completed at Snaresbrook, in Essex, is built of the refuse of the brick-fields, mixed with sharp sand got from a good depth, there being a sewer in course of construction close by. The concrete is composed of one part cement to seven parts of material. The prime cost of the walls, including the working the apparatus, was 7*l.* per rod. Many of the statements that have appeared in print upon concrete are not correct. It has to be borne in mind a yard of concrete mixed dry, when wetted and put into the apparatus, falls considerably short of a yard,—at least 15 per cent. Neither does the cement make bulk, but disappears in measure, as does the water. If lumps of stone can be got, or brick burrs, or old bricks, to pack into the wall, it makes better work and cheaper. The more the cement can be displaced the better for the work and the less the cost. Great care should be taken the cement is not too fresh, or it will cause the work to crack. It should be at least a month old before using.

The concrete villa at Addiscombe-road, Croydon, is now completed and occupied; it gives great satisfaction, and, it is said, will be the only house the rain will not penetrate in that neighbourhood. The lower floors are all of concrete, and perfectly smooth and warm; there is no channel for a mouse or any creeping thing in that house, unless it take up its abode with the family. I forgot to remark, the porch in front of the chapel at Snaresbrook is built of white brick, by desire: the whole of the other work to the walls around, some 130 ft. long, 5 ft. high, 6 in. thick, without a pier, are all of concrete. Some of the walls near by are 12 ft. high, and 9 in. thick.

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In the course of these particulars, Mr. Goodwin makes an observation on which we may usefully enlarge. He says:—"It has to be borne in mind a yard of concrete mixed dry, when wetted and put into the apparatus, falls considerably short of a yard,—at least 15 *per cent.* Neither does the cement make bulk, but disappears in measuring, as does the water." In the prize Essay on Concrete, by the Conductor of this journal, published in the first volume of the Transactions of the Institute of British Architects, this loss of bulk in making is pointed out, and experiments are referred to which show a diminution in those particular cases of about one-fifth.

In the year 1857 Mr., now Professor, Lewis read a paper at the Institute of Architects with the view of showing that this asserted loss did not take place. The writer says:—

"The general idea with respect to this material is—1st, that there is a sensible loss in bulk of the ballast, independently of that of the lime; and, 2nd, that the materials, on being mixed together, expand considerably. So much is this idea prevalent, that a respectable builder—one, I am sure, quite above stating anything that he did not believe to be true—required, in calculating the price of the concrete, that I should allow him one-seventh more ballast than the concrete cubed to, he depending on the published statements of the loss of ballast being thus great. It was this demand that first led me to experiment. The following trials were all made in the same manner, and, with one exception, I was present at the whole process from beginning to end. Several of the committee of the Architectural Publication Society also attended at the trials. A wooden box was made, holding exactly one cubic yard. This was filled with a fair sample of the ordinary Thames ballast, and such as is used for concrete in London. To this was added ground Medway grey stone lime, in the proportion of one of lime to six of ballast. The whole was then turned out and mixed together in the ordinary way, the cube yard taking about forty gallons of water. The whole bulk would thus stand as follows:—

| | | |
|---|---|---|
| Ballast | 27 | feet cubic. |
| Lime 4½ / Water 6 | 10½ | do. |
| Total | 37½ | do. |

The concrete, thus mixed, was thrown into the box from the level of the ground, so that the lower part would have a fall of about 4 ft., and the upper part of 1 ft. The experiment was also made of throwing it in from a platform, 10 ft. above the ground. In each case the result was the same, viz., the whole mass, made into concrete, occupied precisely the same space as the dry ballast, viz., one cubic yard, all the bulk of the lime and water, being about two-fifths of that of the ballast, being lost, but none of the ballast itself. The surface was carefully levelled, and thin boards tacked over, so as to ascertain if there were any expansion in the setting, but none could be perceived."

We needed no inquiry to assure ourselves that as a rule, whatever might have occurred on the occasion described by Mr. Lewis, the original statement as to a loss in bulk was correct. In order, however, to obtain the experience of others on the point, we made numerous fresh inquiries, and found the answers so unanimous in confirming our views, that it seemed unnecessary to notice the contradiction. The statement, however, that there is no loss in bulk of the ballast having been adopted in consequence in more than one book of reference, and loss having accrued to individuals in several cases through faith in it, it is desirable that the truth should be established.

The Messrs. Lucas wrote:—

"We have the pleasure to forward you, as promised, the following particulars of experiments made with concrete. They were made at the new Italian Opera House, Covent Garden.

A deal measure, 3 ft. by 3 ft. and 3 ft. deep, carefully made for the purpose, was placed upon a wood floor, and filled with ballast thrown in from a shovel, and made quite level on the top. The ballast was then taken out and mixed in the usual manner (upon the wood floor), with three bushels of ground stone lime, and thrown again with shovels into the measure whilst hot; the concrete, when first put in, exactly filling the measure, as did the ballast before being mixed with the lime.

A deal measure was used in order to ascertain if any expansion took place, but as it retained its shape, none occurred horizontally, nor did any appear vertically.

The experiments were made with 'gravel taken from the excavations, well screened, and with unscreened Thames ballast,' the same quantity of lime being used to each, and the operation performed alike in both cases. When set, the concrete formed with the screened gravel, had diminished in height about 1½ in., or

1-24th, and that formed of Thames ballast unscreened, about 2¼ in., or 1-16th. We think, however, that had the concrete been thrown in from a stage, the subsidence would have been greater, most probably 1-12th, and should not think it safe in making an estimate to calculate the subsidence, as less than 1-12th."

Mr. Edward Druce, the resident engineer at the Dover pier works:—

"I have found that with the materials such as we have, 22 parts of the materials when mixed together and measured dry make about 17½ parts of liquid concrete."

Mr. Plucknett (W. Cubitt & Co.) said:—

"We have found from actual experiment that 5,722 cubical yards of Thames ballast made 4,891 cubic yards of concrete. It was thrown from a height of 10 ft. This quantity of concrete consumed 544 yards of *ground* stone lime."

The result of some experiments made by Mr. Buckwell at his Phœnix Stone Works, East Greenwich, was, that "a cubic yard of cement concrete contained 34 cubic feet of ballast and 5 cubic feet of cement."

Mr. G. Robertson, the resident engineer at Leith Docks, wrote more fully, and thus:—

"When the ballast was moderately dry, 12 cubic yards of ballast and 2 cubic yards of fresh ground lias lime made 11 cubic yards of concrete mixed and deposited, the waste from the dry materials being then 22 per cent.

But, if the ballast was very *dry*, the same quantity might only make 10 cubic yards, and *vice versâ*. The first quantity is the average, however, of thousands of yards, and may be depended upon as accurate in practice, with the above proportion of lime.

A cubic yard of concrete requires on the average 38 gallons of water of mixture, of which 8 gallons are required chemically to form hydrate of lime, and 30 gallons remain free in the concrete.

The expansion in setting varied from an extreme of 1-30th in hot summer weather to 1-48th in winter during cold weather. This is the expansion for a cubic foot enclosed in a box; on the large scale it is not so great, as the weight of a mass above aids in keeping it down. With lias lime, which slakes slowly, there is expansion going on for perhaps a month. More particulars about the lias lime will be found in a paper I read before the Institution of Civil Engineers in 1858."

The use of concrete will probably extend, and it is of importance that all the circumstances attending it should be rightly understood.

## ARCHITECTURAL DECORATION IN THE EIGHTEENTH AND FIRST CENTURIES.

An accurate and minute representation of the details of the domestic architecture of a given period seems to bring before the imagination, with striking force and startling reality, the very tone and movement of the social life of the people. The glimpse into daily habit, in the Augustan times, which is afforded by a visit to the unveiled *atria* of Pompeii has more power in stimulating the imagination to realise the Roman life, during the decadence of the first Christian century, than the whole library of classical literature. We look, indeed, to pictures for the same class of information, but it is not often that we find faithful pictorial records of manners far removed from those of our own time. We are apt to think the clustering wigs, the ponderous garments, and the stage-struck attitudes represented by portraits and statues of the eighteenth century exaggerated and unnatural. We do injustice to the artists. They did but represent what they actually beheld, and reflected the pseudo-classical charlatanism which was the fashion of the hour. Yet we fail to realise the truthfulness of the powdered effigies. The graphic portrayal speaks in a more dead language to our sympathy than do the records, the letters, the memoirs of the persons portrayed. The intellectual, political, passional life of the day more closely resembled our own than did the dress, the country, or the general appearance of the men and women. The former seems to appeal more directly to our common human nature than does the latter. But, if we can, as it were, peep into a room, one, five, nineteen, centuries old, from which it might be thought that the occupants had only just stepped out, we come face to face with the life of the period in a very striking and instructive manner.

Such a treat for the student of the morals, the manners, and the art of the eighteenth century is now offered to the visitors to the South Kensington Museum. What the Crystal Palace, in its palmier days, effected by way of reproduction of Roman, of Moresque, or of Mediæval architecture, is excelled by this representation—it is a reality, not an imitation—of the boudoir of a lady of the Court of Paris in the days of *Louis Seize*.

This piece of decorative architecture, painted on panel, has been erected in a corner of the eastern arcade of the south-eastern court of the Art Museum. The legend attaching to its history, as stated by the officers of the Museum, is as follows:—M. Serilly, one of the paymasters of the army of Louis XVI., who lived in the old Rue St. Louis, in the Marais (now the Rue de Turenne), married one of the favourite maids of honour of Queen Marie Antoinette. During a temporary absence of M. Serilly from Paris, his wife, with the assistance of the Queen, caused this boudoir to be fitted up, as a surprise to him on his return.

From the Serilly family the house passed to M. St. Aubin, by whom, through M. Achille Juvinal (the well-known antiquary and writer on tapestry and similar subjects), it was sold to M. Recappe, and so came into the possession of the Museum.

We are thus invited to enter the actual apartment which, eighty years ago, was finished with all the graceful taste of the period, for the delight of the chosen darlings of wealth and of courtly favour. The lesson which it offers is as intelligible as it is impressive. The luxury of Imperial Rome had been transplanted to the banks of the Seine. The erotic legend of a poetic mythology, illustrated by the ablest artists of Europe, was represented on the walls. The worship of pleasure, if, as became the climate, in a guise somewhat less unveiled than in a *venereum* at Pompeii, yet no less distinctly and exclusively followed out, is brought home not only to the imagination, but to the senses. The little apartment (13 ft. square, 14 ft. 6 in. high to the level of the top of the projecting cornice, and 16 ft. to the centre of the coved ceiling) has two sides occupied each by a window, one by the fireplace, and one by a door. The great proportionate height, while it diminishes the apparent size, and somewhat lessens the English notion of the comfort or *snugness* of the apartment, is well calculated to promote the feeling of enjoyment, a fact of which those who have passed from the occupation of lofty rooms to that of apartments with lower ceilings are made very practically aware. The panelling is of a delicate white, tastefully painted, and inlaid with gilt mouldings and arabesques. In the centre of the ceiling is represented Jupiter,—not a very noble figure, by the way,—resting by his Eagle. Large bronze shells occupy each corner of the coved roof, the lower part of the decoration of which is hidden by the bold projection of a rich cornice. Below this, a scroll pattern, traced in gold and flowers, runs round the room. Scutcheons, or shield-shaped ornaments, range below; and under these, again, are painted circular medallions, with a row of oblong medallions beneath. Under these last are inlaid metal figures, in low relief, bearing vessels on the head. A band of scroll pattern, in gold and flowers, as in the upper part of the decoration, follows; and the base is occupied by Cupids supporting vases.

In four lunettes under the cornice are the largest and most highly painted figures that ornament the apartment:—Vulcan, girt with a leopard-skin, and armed with a ponderous hammer—not the swarthy god of the industrial forge, but the emblem of skill made the slave of luxury; Pomona, with a *cornucopia* laden with fruit, telling of that horticulture which waited only on the service of the *château*; Juno, imperious and scornful, half asleep beside her characteristic peacock; and a stern river god, the only figure who seems to have preserved somewhat of his natural vigour, uneffeminated by the enchantments of the scene. Ceres and Bacchus, Vulcan and Vesta, appear in medallions on the ceiling.

The grey Italian marble slab of the chimney-piece, with its ormolu ornaments, is upheld by two finely-carved, bearded, terminal figures,—works, not of a mere decorator, but of a sculptor. The interior, or lining of the fire-place (in which silver dogs no doubt held the fuel), is the only part of the room which reminds us of later progress in the application of fine art to the service of architectural luxury; the embossed cast-iron back and sides being inferior in sharpness of execution to the work we should now produce. Even this inferiority, however, is not out of keeping, when we consider the purpose to which this old ironwork is applied.

In the panels on either side of the window to the east of the room, and in the corresponding decorations of the door which is opposite, the painter seems to have given rein to the warmest luxuriance of his fancy. In the former, a delicately-tinted Venus, girt with but the slightest apology for a *cestus*, stands caressing a dove on her bosom, while its mate flutters above. Overhead, and beneath the feet of the goddess, are painted a dove and a goat. *Vis-à-vis* to the Queen of Beauty advances Mars, no longer the God of Battle. A dove broods on the summit of his helmet; and he holds out a wreath of flowers in his hand. Above him a cock corresponds to the dove of Venus; and below, a fox, peering out as if for grapes, reminds one of the famous fable of Æsop. The pendent panels by the doorway are painted with figures of Diana and Endymion, and with hunting dogs and groups of game.

It is true that there is yet much wanting to the reproduction of the full effect of this elegant apartment. It is still far from finished. Very much, in all French rooms, depends on the effect of the hangings, the *parqueterie*, and the furniture, all which have yet to be supplied. To that antique and correct taste, at the result of which, in producing true luxury of furniture in contrast to mere display, the Memoirs of M. d'Abrantes give such an instructive glance, could alone be intrusted the appropriate furnishing of such a boudoir. It is true that in the immediate vicinity there are to be seen rare and costly specimens of the articles of luxury of the period,—inlaid and painted tables, embroidered chairs, painted and gilded china; but it is impossible to look at the restored apartment without feeling that, in order to do it full justice, the architect who designed should also have furnished it. All is so harmonious, all is so utterly Pagan (without one glimpse of the sterner redeeming features of the Pagan life), that the step back into a hall reared for the æsthetic education and delight, not of a choice and dainty *noblesse*, but of the teeming population of the largest city of the nineteenth century, seems a practical anachronism. It has been, indeed, a deluge that has intervened between the Paris of which we have here a specimen, and the Paris or the London of to-day!

The value to the architect or the decorative artist of such a specimen of the fine art of a luxurious period, applied to domestic architecture, is very considerable. A lesson of yet more serious import may be drawn from a study of the scene we have attempted to describe. With the revival of learning, and of that taste for classic literature which yet illustrates the memory of the period of Leo X., commenced an attempt, on the part of those who directed the course of fashion, to re-establish some of the worst evils of decaying Roman civilisation. With classic taste was introduced the fashion of classic morals, or rather of that laxity in certain respects which was so fatal to the over-wrought civilisation, first of Italy, and later of Gaul. But a stern retribution befel those who renounced, in a great part, only its darker vices. While men and women thought only to repeat the story of Lucullus, or to imitate the luxury of the senators or of the emperors of tottering Rome, those who were ground to the very dust to support a heartless idleness in which they had no share, went yet a step further back. They drank yet deeper at the fountain of classic history. They learned how the pride of Tarquin sharpened the sword of Brutus. They recalled the *great word* which was older than empire among the Romans. From the mock classic drapery of the court of Louis XVI. emerged the giant spectre of the Republic. The people were taught to look backwards with admiration. They did so, at last, with a vengeance!

It is highly instructive to compare the revived pagan taste of the period to which we have referred with those actual relics of Roman times which are yet continually being brought to light in Campania. But the courts, and frescoes, and mosaics of Pompeii are, if not familiar, yet at least, as to their representation and description, readily accessible to our readers. The literature of the subject is ample. It is more suitable to our purpose to refer to the latest progress of discovery, and to compare with the lady's boudoir of the decrepit French monarchy, the proportions and adornment of the imposing Italian villa which is even now in course of exploration at Palermo.

In sinking holes for the fixing of some of the

masts which are used for the displays of the fireworks in which the Southern Italians take so childish a delight, in the month of December last, in the Piazza Vittoria, at Palermo—opposite the archipiescopal palace—some remains of ancient buildings were brought to light. Professor Cavaliere, and a committee interested in the promotion of the fine arts and discovery of antiquities in Sicily, directed attention to the subject, and were rewarded by the discovery of the foundations of a large edifice, some 100 ft. in length, at a depth of about 4 ft. below the level of the soil. A porch, or vestibule, with two carved door-jambs, on which it appeared that hinges had turned, gave entrance into a hall, nearly 80 ft. long, entirely paved with mosaic work. A doorway, graced by two Corinthian columns, led thence into a long gallery, also floored with mosaic, which again opens into a square apartment, leading into other chambers. An external gallery, the floor of which is 6 in. higher than that of the rooms included, runs round part of the house; the whole of which had not been uncovered at the time when the description was taken.

In one of these apartments Orpheus, dressed as a shepherd, with a lyre and an iron instrument in his hand, is represented in mosaic of a very correct style; and is admirable in attitude and expression. The work, however, is nowhere equal to that of the great hall, which, for beauty of design and freedom of execution, is said to be one of the finest specimens of Classic art that has yet been discovered. In the vestibule is represented a life-size nude figure, which is in a bad state of preservation. The floor of the hall itself is divided into five longitudinal and thirteen transverse compartments, adorned with geometrically-drawn polygons, stars, and frets. A large medallion in the centre is supported by four nude figures. Half-clothed females, wearing diadems, are in other compartments, one seated on a flying griffin, one on a sea-monster, one on a horse with the tail of a dolphin, and one on an eagle. A superb head of Neptune, armed with his trident, is a pendant to one of a radiant Apollo. Two horned heads, one representing a youth, and one bearded, Leda and Jupiter, and a faun chasing a nymph, form the principal subjects of this superb composition.

Three compartments have been injured, and barbarously restored. The head of the female on the sea-monster is wanting, but, notwithstanding these imperfections, the grandeur and beauty of this splendid mosaic are such as to have produced an extraordinary impression on all those, competent to judge of such works, by whom it has been seen. The complete uncovering, and accurate delineation, of the entire ground plan of this important villa will be awaited with unusual interest.

In the comparison thus afforded between the decorative art of classic, and of pseudo classic, times, we cannot fail to be struck with the greater power of the earlier people. Where the light taste of the Parisian courtier adorned, with a decoration as perishable as it was elegant, the walls of a single *appartement*,—a floor which, it may be, had a shop below and a garret above,—the Roman designed in stone, and produced pictures which even the earthquake could not obliterate. In fact, it is to the most terrible forces with which we are acquainted, the fury of warlike storm, or the energy of elemental disturbances, that we owe, almost exclusively, our relics of ancient decorative architecture. The ashes of Vesuvius have preserved the frescos and mosaics of Pompeii, which look, at the moment of their discovery, as fresh as when they were buried in that black and blinding snow. Violence and fire have thrown those mounds over the ruins of the palaces of the Assyrian kings, from beneath which their uninjured sculptures are now disinterred. In cases where cities never cease to be inhabited none but the most massive architectural features can escape the transformation due to repair. It is only where the destruction has been overwhelming that what has been preserved has been preserved unchanged.

But the painted panels of the Louis XVI. Saloons would have become entirely obliterated by such an overthrow as has preserved the noble mosaics of Palermo. Climate, no doubt, goes for much, and the distinctive action which the climate exercises on wood has taught the Italian builder to make use, whenever it is practicable, of stone or of cement. But however we can account for it, the difference remains. If we compare the work of the two periods of decadence, of the corrupt Roman life which was swept away by the sword of the Goths, and of the corrupt French life which, if but for a moment, was swept away by the Terror and the guillotine, we find the former to be that of men who wrought for all time; the latter, that of men who wrought but for the moment.

Another, and a not unimportant difference, may be traced between the art of the empire and that of the *ancien régime*, between the decorators by oil and the decorators by mosaic. It is that of the superior truth that distinguishes the earlier. Representations of Jupiter and Mars, of Venus and Diana, in the halls of the most Christian king or of his courtiers, were nothing but a *sham*. In those of the Roman senator they indicated a reality. Without supposing that the Roman gentleman of the time of Cicero or his readers were altogether possessed with faith in a mythology such as is to be found in the pages of Lempriere, there is yet no room to doubt that their forms of thought and modes of speech referred at least as distinctly to the immortal gods of Rome as do those of the Italian of the present day to St. Joseph or St. Januarius,—to the Madonna or to St. Anne. As in the painted or modelled nook that is to be found in almost every Italian court or garden,—where a daily offering of flowers, or a half-burnt taper, represents the homage paid, in former days, to the Lares, or to Pomona,—there is an indication of the presence of an actual power or force, for good or for evil, ever operative on the popular mind,—so was it with the representation of gods and heroes in the times of our earlier paganism. Nor did the worshipper invoke their aid in mockery. In many aspects of what we now call morality, especially in all that regards the relation of the sexes, the code of Roman manners was far looser than that of Romish prescription. But the manners were not at variance with the code. The emperor had no lurking scruple that he ought to absent himself from the sacrifices because of his devotion to any Roman Madame de Montespan. For a monarch to live in the open disregard of the laws of a religion in defence of which he devastated whole provinces because their inhabitants would not kneel at his altars, was an anomaly unknown even to those who earned the terrible title of foes to the human race. And accordingly, much and repeatedly as Rome suffered from her captors, never was she wetted by her own children with so fierce a baptism of blood as the St. Bartholemew, or its *contre-coup*, the Revolution. The gods of Rome, daintily painted on the walls of *salons* of Paris, told of an unreality in the morals of the day, which was to meet with a very stern rebuke. Viewed in this light is there not much that we ourselves may lay to heart, in the reflections suggested by a visit to the boudoir of Madame de Serilly?

## SOCIAL SCIENCE CONGRESS IN BRISTOL.

After a meeting of the Council of the Association on Wednesday morning, the Bishop of Bristol preached a sermon in the cathedral, which was well attended. In the evening, Sir Stafford Northcote, bart., M.P., as president of the Congress, delivered the opening address in the Victoria-rooms, in the course of which he commented on the various subjects in the programme. We confine ourselves to what the speaker said on sanitary matters, and a portion of his remarks on the education of the labourer:—

*Sanitary Questions.*

I hope that in what I have been saying I have not led you for a moment to suppose that I undervalue the immense power for good which resides in the State, and which can only be exercised by the State; or that I am of opinion that what the State now does for the advancement of important social objects is anything like sufficient. On the contrary, I believe that there never was a time when State assistance, of the right kind, was more needed for the advancement of these objects than at present. The State is, or ought to be, in the possession of much more perfect information than any private body; its command of the machinery of administration is greater in almost every department of life; and it holds a position of independence and authority, which gives it advantages to which no private individual or corporation can make any pretensions. It is, therefore, most reasonable that in examining social questions we should give great prominence to the inquiry, how far the State can properly and usefully interfere to promote social improvements. This inquiry we very naturally make in connexion with the third of the great departments of this Association,—the Department of Health. Public health, as has well been said, is public wealth; and it is a description of wealth, which, it is to be feared, we do not husband so well as we ought to do. Now, no amount of individual care, or of individual skill, can do what is wanted in this matter. Combined action is necessary to secure to the great masses of our population the first conditions of a sound sanitary state, to check the propagation of infectious disorders, to prevent overcrowding in dwelling-houses, to provide an adequate supply of pure and wholesome water, and otherwise to bring all the forces of civilisation into play in order to counteract the evils which civilisation brings in its train. For these are not inconsiderable.

It is not quite without reason that the ancients feigned that the introduction of the arts of life by Prometheus was followed by the introduction of a host of new and unknown diseases, especially when they added that mankind had by their own carelessness forfeited the gift of perpetual youth with which the gods had, in the first instance, crowned the measure of their blessings. The progress of population, consequent upon the increase of wealth, and the ever-encroaching exigencies of competition, tend very obviously and directly to the introduction of new dangers to health and to life. But the antidote accompanies the poison, if only we have the skill and the sense to use it; and it seems to be a legitimate function of the State to take care that, while private enterprise is hastening after the acquisition of wealth, and is applying all the resources of science to its production, recourse should also be had to science for the protection against the evils which the wasteful, because selfish, spirit of private enterprise might otherwise engender. It is much to be regretted that we have not as yet a thoroughly well-organised department of the Government charged with the duty of superintending our sanitary system. There is, I am convinced, abundance of work for a Minister of Health, and I believe that such an officer would be able amply to justify the expense which the department would occasion by the services he would render. We must remember that there is the broadest distinction between Government interference with private enterprise and Government support of private enterprise; and we must not confound the creation of public offices for the promotion of important objects with the absorption of all dealings with regard to those objects by the State. The time is probably at hand when three new Ministries must be created: a Ministry of Health, a Ministry of Education, and perhaps (though on this point I speak with diffidence) a Ministry of Justice. The present day, however, is the day of Royal Commissions; that of Ministries is yet to come. More than one such commission is now inquiring into questions affecting the public health. The most important is that presided over by Sir Charles Adderley, which is considering the consolidation of our very complicated sanitary laws, and the completion of our system of sanitary organisation. Those who are in the habit of paying attention to the connexion between the growth of national habits and the growth of national language, will not have failed to notice the recent introduction among us of the phrase State medicine, a phrase absolutely new to many of us, and perhaps still imperfectly understood by the general public. Let me, by way of giving an idea of what it is, quote the list of subjects which, as a committee of the General Medical Council inform us, have been suggested as proper for the examination of candidates desiring to take out a diploma in State medicine, and to enter the Public Medical Civil Service. They are: forensic medicine, toxicology, morbid anatomy, psychological medicine, laws of evidence, preventive medicine, vital and sanitary statistics, medical topography, and certain portions of engineering science and practice. State medicine, in short, as a member of the committee well expresses it, consists in the application of medical knowledge and skill to the benefit of communities, which is obviously a very different thing from their application to the benefit of individuals in private or curative medicine. We are all of us aware that medical men are continually being called on to perform public duties which lie wholly beyond the range of their private practice. They are called on to give evidence in courts of justice as to the nature of injuries, the causes of deaths, the sanity or insanity of in-

dividuals, the presence or absence of poisons, the wholesomeness or unwholesomeness of articles of food, of water, of the vapours occasioned by particular kinds of manufacture, and so on. They are or may be called on to act as coroners, as inspectors of the sanitary condition of workhouses, of prisons, of ships, of barracks, and of various public buildings. Their advice is required in relation to the purification of rivers, the drainage of towns, the regulation of burials, the repression of contagious and infectious diseases both among men and among animals, quarantine, vaccination, and numerous cognate questions. In fact, it is difficult to assign a limit to the demands which the State might with advantage make upon the time and intelligence of a well-organised Medical Civil Service. These remarks naturally suggest two reflections. In the first place, we seem to want a body of men able to withdraw themselves without inconvenience from the engrossing demands of private practice, and to devote themselves to the especial study of the public questions which require medical attention. To a certain extent, of course, it is desirable that all medical men should study those questions; and upon some of them it is necessary that they should be prepared to give opinions as cases arise. But the physical powers, even of medical men, are limited; and it is impossible that a doctor in large private practice, with all the anxieties which such practice necessarily entails upon him, should give to questions of a public character the time and consideration which their importance demands. In the second place, when we have got our Medical Civil Service, how are we to turn it to the best account? This is undoubtedly a question of great difficulty, and one which must lead us into other fields of inquiry, for it connects itself very directly with the whole question of local organisation, and of the relations between the central and the municipal authorities of the country. If we are to have an organised medical staff spread over the face of the land, some kind of local organisation will be required for it; the machinery cannot be wholly worked from London. The solution of this problem will, I hope, be materially assisted by the labours of the Royal Commission now sitting under the presidency of Sir C. Adderley; and should it be solved satisfactorily, the result may be important in more ways than one; for a good system of local organisation for one purpose will greatly facilitate the establishment of a good system for other purposes. Few greater advantages could be conferred on England than a well-considered framework of local self-government, charged with the administration of most of those matters of which this Association takes cognisance,—of justice, of health, of education, of charitable trusts, and so forth,—subject to due control by the supreme central power.

I should have been glad, had the time permitted, to make some remarks upon the sanitary questions which have been raised in British India, and upon the measures which have been taken for the improvement of the public health there. But I should be tempted into too wide a field; and though I am well aware of the great interest which the members of this Association feel in all that relates to the social condition of our Eastern Empire, and of the personal labours there of one whose name I need not mention in the present assembly, for I am sure it is in all our hearts, I must exclude India altogether from the field of my observations.

*The Agricultural Labourer.*

I pass on, then, to the fourth head of your labours,—the department of Economy and Trade. And here I find that you propose for special discussion the questions of the administration of the Poor-law, of assisted emigration, and of the condition of the agricultural labourer. . . . Now for the improvement of the agricultural labourer you want two things—you want to raise the standard by which he measures himself, to teach him to aim on behalf of his children, if not on his own behalf, at something higher than he has hitherto been content with; and to place within his reach the education and training necessary to enable him to reach that standard if fair play be given him. That is one thing which you want: the other is that he should have fair play; that his work should be paid for in such a manner as to make it his interest to do his best; that he should be encouraged to form habits of diligence and of independence, and should be made to feel that his destiny in life is to a great extent under his own control. You want, in fact, to operate upon the individual, and to make him work out his own improvement. This is a task not only distinct from that which the advocates of artificial systems for the wholesale elevation of the labouring class propose to themselves, but one which in practice will often be found antagonistic to them. Those who are interesting themselves in the improvement of the condition of the labourer may, I think, be divided into two schools. The one is animated by the spirit of the trade-union, the other by the spirit of piece-work. The one would work through the class, the other through the individual. I take my side with the believers in piece-work. Not that I dispute or doubt the reasonableness of such an organisation of labour as is sufficient to protect the individual labourer against the possible exactions of the capitalist; if trade-unions or labour-unions could be confined to that object, they would be deserving of respect and of sympathy. But when they go further and demand of their own members that they should limit their individual exertions so as not to produce more or to earn more than their fellows, they introduce a principle at once unjust and dangerous. There is no saying what injury they may not thus inflict upon their neighbours; there is no saying even what injury they may not inflict upon their country, by restricting the development of its industry, and possibly driving out of it branches of business essential to its prosperity. The theory of co-operation is indeed a beautiful one; but it seems better suited to the republic of Plato than to the atmosphere of this work-a-day world. It will, no doubt, commend itself to those who abhor what they call privileges, who prefer equality to liberty, and who look to the State to exercise the evils of the inequality which nature has unhappily inflicted on the human race. This is the theory which finds its latest expressions in the proposal of one of the societies represented at the late National Labour Congress at Philadelphia, "that when an employer refused to make an advance in wages or a reduction in the hours of labour, the State should employ such workmen." I presume that in such case the workmen would both fix the amount of wages they would like to receive, and name the amount of work they would like to do in return, leaving the taxpayers to make up the difference between the two sides of the account. It is a theory which may well find advocates; but to many of us—I hope to the majority of us—individual freedom and fair competition are the very breath of our nostrils, and long may it be ere we are deprived of them. What I have said of the artificial system of trade-unions applies, I think, at least in a degree, to the artificial system of assisted emigration directed to the diminution of the supply of labour. I do not believe that in this country there is a real surplusage of labour. Population advances very much less rapidly than does the accumulation of capital; and were it not for the very rapid increase of machinery our labour supply would now be extremely deficient. It might very easily happen that by the injudicious encouragement of wholesale emigration we might drain the country of its strength and drive away employment to other lands, just as we might do by an injudicious attempt to force up the rate of wages beyond the natural level. England holds a very high position in the industrial world, but it is one which rests upon a somewhat narrow basis; it is one which it would be comparatively easy for her to lose, but exceedingly difficult, if not impossible for her, if she once lost it, to regain. I look, then, for the improvement of the condition of our labourers generally, and of that of the agricultural labourers among them, to the free play of individual competition under favourable circumstances, rather than to any artificial remedy. But do those favourable circumstances exist? Has the agricultural labourer really fair play. Has he the opportunity for raising himself? Has he the inducements to exert himself? I fear we cannot give a wholly satisfactory answer to these questions. I cannot doubt that the system of the Poor-law, taken as a whole, has exercised and still exercises a deadening influence upon our labourers, or that it tends greatly to neutralise the wholesome spirit of competition and self-reliance which it is so important to arouse. It is a system which could not be summarily set aside without serious hardship and injustice; but it is a system from which it should be our endeavour as far as possible to teach our labourers to emancipate themselves. Nor is such emancipation visionary. The machinery of the law must of course be retained; there will always be plenty of cases of unavoidable suffering to be relieved by it. But if the labourer be trained in his youth to recognise the duty of laying by a provision for his old age,—if he be early taught prudence, and foresight, and self-denial, and if at the same time the means be provided him of investing his savings with perfect security, which he has now great difficulty in doing,—a great step might be taken in advance; and if his employers be brought to see the wisdom of so regulating his wages as to enable him by additional labour to earn additional remuneration, and so encourage him to increased industry, the heavy weight of pauperism which now oppresses the energies of our people might to a very great extent be shaken off.

Earl Ducie, the Dean of Bristol, and the Mayor of Bristol also took part in the proceedings.

## PARIS.

The grille of the Palais de Justice, which dates from the last century, is about to be restored and regilt. The principal gateway, the only one in *repoussé* iron-work,—the Gate of Honour,—is far from being in the same state of ornamentation as it was when first put up; besides, it wants the entablature and the globe crowned and fleur-de-lysé. All the royal insignia were removed in 1793; the accompanying attributes were also removed; but the L L remain. If they signify, as it is said, *Law* and *Liberty*, it is curious that the letters, placed back to back, hint that the two significations march in opposite directions. One thing is certain, viz., that the rusted grille should have been restored, from the state in which we saw it a few days ago, when the rest of the building was being renewed. The repairs of the iron will cost 400*l*.

The rear face of the church of St. Vincent de Paul is about to receive a monumental annexe in the form of a rotunda, with crypt, in order to increase the accommodation; it will be a construction similar to that of Notre Dame de Lorette, on the side facing the Breda quarter, but of much larger proportions.

For a long time past the immense building of the *Magasins réunis*, in the Place du Château d'Eau, has been shut up, owing to the failure of the company. Various rumours have gone forth with regard to the future destiny of the vast pile; a hotel, a monster restaurant, a post-office, &c., all have been hinted in turn. The company who own it propose now, it is said, to found a permanent and universal exhibition, to be called the Galleries of the Château d'Eau. By this plan, to which most of the manufacturing firms have adhered, the consumer will be able to procure necessary objects of household use direct from the manufacturer, and economise for himself the profits of the retailer, which are often, as in England, enormous.

M. Say, the great refiner, of the Boulevard de la Gare, had given orders to M. Saint-Just-Dru, successor of M. Mulot, to sink an artesian well in his vast establishment in the Place d'Italie. It was attended with complete success the trepan reached, at a depth of 1,844 ft., a bed of water which rose up in a column, with a temperature of 82°, furnishing 1,540 gallons per minute. With tubing, the water will rise to 60 ft. or 100 ft. above the ground. The operation only required four years, the total expense not having exceeded 12,000*l*. Two other artesian wells, as we have before stated, are being bored for the municipality of Paris: one at Lachapelle-Saint-Denis, near the rond-point, under the orders of M. Degoussée; the other at the summit of the Butte-aux-Cailles, at the southern extremity of Paris, the works being confided to M. Saint-Just-Dru, who bored the well for M. Say.

The black wooden tower which formerly stood over the Passy well no longer exists: a rock about 4 ft. high stands in the middle of a neat fountain-basin. Through a hole in the rock, 1 ft. in diameter, gushes forth the streaming torrent into the basin. There is no engine, nor building, nor sign of one near, so that the phenomena may be studied in all their wonderful aspects. The height of the jet is not great, as the diameter of the bottom of the well is less than that of the top; but the quantity astonishes any one who has never seen an artesian well exposed. As to the temperature, on a cold day the steam may be seen at a considerable distance.

The French Translantic Cable is working well. The number of messages for the week ending the 4th of September was 448, producing 1,000*l*.

The works of the new Opera-house have made a regular spurt lately; the inside work is well in hand. It is said that superior orders have been given to the contractors to have the theatre ready by the 15th of August, 1870. Scaffoldings are being erected for hoisting the bronze Pegasus, now exhibited in front of the Palais des Champs-Elysées, the work of M. Oudry, of Auteuil; it will be placed on the summit of the theatre. A splendid *lampadaire* of vast dimensions is being put in place; so, after all, the opera will be ready before the Hôtel-Dieu; at least, so it seems. Carpeaux's group has been cleaned, as we stated; but a letter has been addressed to the Paris papers intimating that a few persons have sworn to destroy the work if it be not removed.

## AN ARCHITECTURAL COMPETITION ONE HUNDRED YEARS AGO, WITH SOME NOTICE OF THE ARCHITECTS.

Some account of an architectural competition one hundred years ago, with a list of the architects' names, supplemented by a few notes relative to the life and subsequent career of a few of these, cannot but be interesting to the readers of the *Builder*. The list is that of the architects, English and Irish, who sent in their several plans for the building of the Royal Exchange, Dublin, in the February of the year 1769:—

1. William Ivory, Norwich.
2. James Gandon,† London.
3. Stephen Riou, Canterbury.
4. T. M. T., Dublin.
5. John and Samuel Hope, Liverpool.
6. J. Jenkins, London.
7. — Everard, London.
8. Timothy Lightoler, Chester.
9. Robert Mack, Dublin.
10. N. J., Dublin.
11. Thomas Rawlins, Norwich.
12. W., Ireland.
13. J. Leroux, London.
14. John Fellow, Southwark.
15. J. T., London.
16. James Workman, Cavan.
17. } Mr. Ivory, two designs, Dublin.
18. }
19. Messrs. Myers & Sproule, Dublin.
20. } William Barber, two designs, Dublin.
21. }
22. Præter Laudem Nullius Avarus.
23. Philotechnos B.
24. } Oliver Grace, two designs, Dublin.
25. }
26. Hibernicus et Amator Patriæ.
27. Francis Sandys, Dublin.
28. J. C., Dublin.
29. }
30. } Thomas Jarrat, three designs, Dublin.
31. }
32. J. W. L.,† London.
33. Peter de la Roche, London.
34. T. S., London.
35. Thomas Cooley,† London.
36. R. Edwin, London.
37. Edward Stevens, London.
38. Thomas Crunden, London.
39. William Donn,† London.
40. James Lovel, London.
41. Thomas Wiggins, London.
42. ⊙ B., London.
43. ⊙ A., London.
44. Thomas Sandby,† London.
45. George Richardson, London.
46. William Blackburn, London.
47. John Whiscard, London.
48. Anthony Chearnly, London.
49. Richard Louch, London.
50. Arthur Blackhall, London.
51. †, London.
52. } William Rigby Naylor, two designs, London.
53. }
54. William Newton, London.
55. John Byrne, Dublin.
56. Roland Omer, Dublin.
57. Michael Priestly, Londonderry.
58. Edward Johnston, Londonderry.
59. Vitringa, Dublin.
60. William Beauford, Dublin.
61. Lodge, No. 158., Dublin.

In the above list those marked † were considered the best designs by the Trustees. It will be seen by a reference to the list, that London contested stoutly with Dublin for the prize, and succeeded in winning it. Thomas Cooley was adjudged the first premium of 100*l.*; James Gandon received 60*l.*; and Thomas Sandby, 40*l.* In looking down the list, we identify a few names whom the pall of oblivion has not hidden; and by a little painstaking rubbing in the neglected corner of our architectural history, we are enabled to restore and fix two or three more whom the mists of a century were fast hiding from our sight.

Of Thomas Cooley and his *chef d'œuvre*, the Royal Exchange, of Dublin, we gave some particulars a short time since.* James Gandon, soon after the competition, passed over to Dublin, became a resident, and rose to fame. In fact, he became the first architect, *par excellence*, as we remarked before. Gandon, although he failed to obtain the first prize for his design in the competition under notice, yet shortly afterwards distanced all competitors. In the Dublin Custom House, the Four Courts, and the Corinthian portico to the Irish House of Lords (now the Bank of Ireland), James Gandon's architectural services may be seen. Gandon designed several works in the capital, and throughout Ireland; he became the associate of the most eminent public men in Ireland and England; was elected member of the Royal Irish Academy; and during his professional career in Ireland he contributed some articles to the foremost publications on the rise and progress of architecture in Ireland. Gandon was a bosom friend of Captain Grose, the famous antiquary, and though dying many years subsequent to him, he was buried with him in the same grave in the village churchyard of Drumcondra, near Dublin. The Mr. Ivory who exhibited the two designs 17 and 18 was a native of Cork, and, like Thomas Cooley, was originally a carpenter. He was a skilful workman, and for some time followed gun-stock making for the chief gun-maker for the Ordnance in Dublin. Ivory imbibed a taste for architecture, and by close study and a determination to succeed, made a rapid progress in the knowledge necessary to the pursuit of the profession. He learned drawing under a master named Bell Mires, but he soon eclipsed his tutor, and was shortly afterwards appointed drawing-master in the Dublin Society School of Art. Ivory became also a surveyor to the Revenue buildings, and he held this office to the time of his death, which took place in 1786, in the fifty-fourth year of his age. Ivory's designs for the Royal Exchange, though they missed the premium, were rewarded with a piece of plate, along with some others. The exhibition of the designs for the Royal Exchange led to the improvement of Ivory's style of drawing. The Blue-Coat Hospital, Dublin, and the Bridge of Lismore were among his public works. It is said he furnished designs for the Courts of Law and for Newgate. Newcomen's Bank, in the Irish capital, was also designed by Ivory, along with several private dwellings throughout the country. Ivory was much given to redundant ornamentation and embellishment, as may still be seen on his works, and this, in the opinion of some detracts from the external appearance of more than one of his successful buildings. Whether William Ivory, of Norwich, whose design is marked 1, was any relation of the Dublin architect, we know not at this lapse of time. The latter's Christian name was Thomas.

The name of Peter de la Roche, the inventor of a new "Sixth Order of Architecture," appears at 33 in the list. Some account of this notable personage will be found in the standard architural works of this century.

William Beauford, M.A., No. 60, was the principal of a classical academy in Cork, as late as the close of the last century. He was very ingenious in mathematical problems, and was the writer of some papers "On the Theory of Walls for Roofed Buildings." He compiled tables also for showing the thickness of cut stone on a brick wall at the top, for the support of all the different angular roofs commonly used in Ireland—of Gothic and common pitch, or of pediment, or whether covered with pantiles, slates, or lead. Some of Beauford's mathematical and scientific theories were published in the "Anthologia Hibernica," 1793-4.

William Beauford was also author of an interesting paper on "The Theory of Columns." His problems were comprised in the following:—To find the strength of an insulated column of any of the five regular orders. Second:—Having the power of any force necessary to throw down a column when applied at the top, and acting perpendicular to the axis of the column, to find the power of the same force when applied down the side, and parallel to the axis. Third:—To find the strength of a column having part of its diameter sunk into the wall. Fourth:—Having the contents of a buttress necessary to support a wall, to find how many columns and pilasters shall be equal in power to the buttress.

He calculated a table which expressed the strength of the columns, and their parts, and also diminished pilasters, the strength of their respective circumscribing cylinders and parallelopipedons, being equal to unity.

In concluding his paper on "The Theory of Columns," Beauford remarks, "Such an inquiry, however, may be of service to architects in enabling them to place their ornaments with judgment both in respect to taste and utility, and not entirely to depend on the caprice of fashion."

The academy over which Beauford presided in Cork, was a commercial and military one. He was previously (1793) at the head of one, or somewhat similarly engaged, in the town of Athy, county Kildare. Strictly speaking, although Beauford sent in a design for the Royal Exchange, he was not, so far as we understand, a practising or professional architect. His mathematical writings, however, were most useful and valuable, and he was proved in the field in the interest of architecture and the building art at a time when the strength of materials received little attention either from builders or their workmen, and when a piece of wood or iron, or any other material, was more judged by its size and weight for obtaining the desired end, than the principles of judicious application, and consequent economy.

Of Edward Johnston, No. 58, of Londonderry, at this moment we know nothing. There was a William Johnston of Armagh, who lived about that time, or a little later; but the only architect of eminence of that name whom we know of belonging to the sister kingdom was Francis Johnston, the founder of the Royal Hibernian Academy, and architect of many public works in Ireland. Whether he descended from either of the other two Johnstons aforenamed, we are not at present able to say. There were other architects of repute in England and Ireland in 1769, but they do not figure in the list unless some of the *noms de plume* hide their names.

Perhaps some of the many readers of the *Builder* will be able to identify other names among this rare and interesting catalogue which we publish to-day, and furnish whatever "waif and stray" they can in making our knowledge more perfect of those architects who played a not unimportant part in our architectural competitions of One Hundred Years ago.

C. C. H.

* See p. 419, *ante*.

## THE SANITARY STATE OF TRURO AND FALMOUTH.

The remarks in our pages "Concerning certain Cornish Towns" (p. 720, *ante*) have produced considerable stir in those towns, and have brought us a dozen letters, some confirming, others denying their correctness. At a special meeting of the Truro Improvement Commissioners, the mayor called the letter in our pages "unfounded and unjust," and then individual commissioners proceeded to point out how much improvement was needed in the town, and how many nuisances were permitted to exist. We have no desire to injure or annoy any person: our object is the general good, and we advise the authorities to take our observations in good part, and to set themselves to remedy the existing defects. We have submitted to the writer of the comments "Concerning certain Cornish Towns," the various letters we have received, especially one signed "An Improvement Commissioner," which has also been printed in the *West Briton*, and we subjoin a part of his reply:—

Truro is a tramp in a dirty condition: he is to be cleaned by a Commission: they stand by as they see his hands and his face washed; the fellow's neck and ears are not touched; his hair is a tangled mat; his body is left in the state it was; yet these Commissioners call the man clean. Clean! ay, a marvel of cleanness, for as the soap is shining on the fellow's face, they exclaim, "By George, you wouldn't know him, would you?"

Now I, "Pro," declare boldly, he is not clean, and that men like "Improvement Commissioner," by their obstinacy and ignorance, have done more to retard the progress of sanitary measures than any number of those who, like at Falmouth, say regarding their own tramp, "Yes, he is dirty, but soap costs money, and we ought not to pay for all of it; there are those two parishes adjoining that ought to help us." Men like "Improvement Commissioner" have done more to keep preventible diseases in stock in England than any other class of men; and they have done more to retard improvement.

I affirm the sewerage of Truro is bad. Years ago, when the cholera raged fearfully in the town, the Improvement Commissioners got afraid, and they made a great many sewers, and I believe the most part of the sewerage may date from that time. They were all built rectangular in section, of common dry stonework, covered with large flat stones (called coverers), as they came from the quarry; the ground was excavated, and

the walls of these sewers were built on the rock: no invert or arch was turned.

These drains, of course, in time fell in from the superincumbent weight of earth, and from the decomposition of the stone used in their make; then it was that the walls, having to be repaired, were repaired with brick, but neither invert nor arch was turned; the walls still rest on the rock, and are still covered in with flag-stones! These are the drains the "Improvement Commissioner" says have been "constructed of brick."

As for the assertion that there are "seven or eight miles of public drains carried to the utmost limits of the town:" seven or eight hundred, if they were badly made, would not show the sewerage in a better light.

But if it is true that there are seven or eight miles of public drains, and also true that no "less than 20,000 ft." of glazed pipes have been lately used in drains, I would point out that not much less than four miles, or more than half of all the drains in the town, have been either made or repaired by means of glazed pipes alone; and then there is the unnamed length of new brick sewers to be added: say, not to be too extravagant with "Improvement Commissioner's" statement, one mile more, or, on the whole, 5-7ths or 5-8ths of the whole of the town sewerage have been recently repaired or made—an assertion which is just one of those wild ones "Improvement Commissioner" might be expected to make, and manifestly untrue to all who know Truro. If a statement be provided, showing where and when these pipes were used, I will thoroughly investigate the matter. I earnestly ask for such statement.

The cesspits were made, as the sewers, of common dry stonework, having a wood cover, set in a wood frame; the openings in and out were untrapped. They, too, have begun to fall in, and some of them have been repaired in the same way as the drains, the stone decomposing under the influence of the sewage matter; and brick walls are built, leaving the bottom on the rock, and, instead of a wooden, a cast-iron cover provided, set in granite. Such a one is the one I particularly spoke of in Mitchell-hill,—please observe I name places,—though I understood it was through possessing a cast-iron cover, built of dry stone walls.

My friend was visiting a poor sick woman living a few yards from this cesspit, and the stench was so bad that it caused a slight attack of diarrhœa.

Now Mitchell-hill is not in "the outskirts of the town," neither is Fairmantle-street, Carclew-street, Charles-street, Union-street, Pydar-street, Goodwives'-lane.

"There are now but a few more untrapped cesspits." Are there? I am glad to hear so much work has been done in the last three weeks. But should cesspits exist at all? And, moreover, should excreta and garbage be permitted to lie in their openings, poisoning all the air around? My statements relative to the mode of cleansing these cesspits remain unchallenged, and also my statement as to the foul smells caused by their cleaning out. If they will have cesspits, why not use disinfectants? If it were pure "road detritus," would it smell? and would it be black or putrid? or has Truro a peculiar strong-smelling "road detritus"?

I was told of the stench-traps that had been inserted, but I was wishful to avoid mention of them, for I felt I might be misunderstood, sewerage being in such an infantile condition in Truro. Let me now point out that the sewers being badly made, trapping all their openings will aggravate the evil, and the houses in the streets will be invaded by noxious smells. Truro may so far be thankful that all the openings into its sewers are not trapped, nor anything like it; in one street I noticed some openings were trapped, but a cess-pit in the middle of the length of the street was untrapped, and a cess-pit at the lower end of the street was untrapped. Thorough trapping is good if the sewers are good, but then the gases generated in sewers are so powerful and penetrating that even if the sewers are good, care must then be taken to ventilate them. That I am again correct in another item is obvious from the "Improvement Commissioner's" letter:—"About 100 large cast-iron traps have been laid over the many inlets to the common sewers." Bearing in mind that there are "seven or eight miles of public sewers carried in every direction, &c," a stranger can readily judge how thoroughly the sewers in Truro are trapped.

Again, by inference, I am correct. "Improvement Commissioner" can see no good in waterworks if they have wells; for was it not found that the "worst specimen of their water three years ago had considerable advantages (*sic*) over a sample from a neighbouring waterworks"? Some few years ago water taken from three or four wells was tested, and it was found full of impurity; the well in the High Cross, and that by some inn—I forget the name, but I think it was the Dolphin—was found particularly bad. I am told, too, that the pumps are continually under repair. Now, by *under repair* is meant the absolute stoppage of water supply to a particular district for an indefinite number of not hours only, but days, and the supply of dirty water for a time longer.

Because a "neighbouring waterworks" (Query, Was that the Falmouth Waterworks?) has a bad sample of water, is that any reason why Truro should be supplied for the most part with water that is not tasteless?

I am aware that in two or three of the main streets are granite gutters, along which flows water, and I am indeed glad to see it there; but "Improvement Commissioner" goes too far in praise of it. It comes from the leats, on which, just before the water enters King-street, is a public privy, the matter from it falling into the water; higher up are another privy, a dye-house, and a wool-stapler's. I am not sure, but I believe Castle-street and another street further on drain into it. The back of the street leading to the railway station drains into a branch of it that goes under River-street, and nearly, if not all, the houses bordering the leats have privies disgorging their contents into it. I saw that from the public walk called the Leats. But if properly kept, those streams are beyond value; if they were well kept, I should not have seen *excreta* rolling down the gutter in Duke-street, and a housemaid emptying her slop-pail into it near King-street. Why, however, should those streets I have named as particularly bad have open guttering? Good guttering is wanted there; at least, as much as in the main streets: it was that of which I spoke.

I was not told there were in every direction in the lower parts of the town brick-built tanks holding many hundred gallons (is hundred a misprint for thousands?). May I ask where they are, and their exact cubical contents? And if they are only in the lower parts of the town, may I ask, of what service they are to the higher portions of the town for either flushing or in case of fire? And have the upper portions of the town anything in the world to depend on in case of fire, but the pumps so sparsely scattered about? And what flushes the sewerage in the higher portions of the town? I mean that portion the more respectably inhabited, as well as that part chiefly occupied by workmen. What have those streets I have named to depend on for flushing or in case of fire?

I wrote of the pitching of the streets, not the pavement: it is in a state only to be recommended by coach-builders.

If Truro has a low death-rate, of which I am not aware, it may be ascribed to the position of the town in and on the sides of a valley, a position that man with all his inanity cannot entirely spoil. If the present health of the town is good, it must be ascribed to God's mercy, not "to the efforts put forth by the authorities of the town."

As to *Falmouth*,—is it true, or is it not, that Falmouth was recently, on the solicitation of some of the inhabitants, visited by a Government inspector (I believe, Mr. Rawlinson)? Is it true that, in consequence of his representations, Mr. Bush was employed to give plans for the drainage of the district? And is it true that, while the town authorities were haggling with the parish authorities of Falmouth and Budock, Mr. Bush died? and but little more has been said of the matter since, except to grumble at Mr. Bush's bill?

PRO.

**Utilisation of Blast-Furnace Slag.**—The following method is now adopted in several iron-works in Belgium:—The slag is allowed to run direct from the furnace, into pits about 8 ft. or 9 ft. in diameter at the top, with sides sloping inwards towards the centre, where they are about 3 ft. deep. The mass is left for eight or nine days to cool, when a hard, compact, crystalline stone is obtained, which is quarried and used for building purposes, but chiefly for paving-stones. They appear to wear exceedingly well, being quite equal to the grits and sandstones already so much used.

## POUNDS.

SIR,—As you have given space to Mr. Tupper's lament over impounded cattle, it may be as well to comfort your readers by the information that pounds are fast going out of use and being removed. As owner of a manor and a pound, I took some trouble lately to find out why cattle never were impounded now as they used to be in my father's day. I found, that in consequence of Highway Acts passed since his time, the police took it on themselves to manage straying cattle, and did not allow my "parish Pindar" to interfere. The pound has had no inmates for at least a dozen years, and therefore I shall *certainly not* erect a comfortable cattle-shed therein. What a pity so much amiable sentiment should have come into the world too late. Even when pounds were in their glory cattle rarely remained many hours unclaimed.

A LORD OF THE MANOR.

*** The following letter from the *Bedford Times* (to give no other proofs), shows that "A Lord of the Manor" is but ill-informed on the subject of which he writes:—

"In your last issue I saw a paragraph from the *Builder*, in which Mr. Martin F. Tupper appeals on behalf of the unfortunate animals that are so often starved in pounds for want of forage and water. A few days ago I saw a curious illustration reported from Newport Pagnell. The writer says:—'It is a small stone-walled enclosure, the bottom well lined with brickbats and glass, the upper part of the wall well studded with broken glass bottles deeply embedded in mortar. Three horses were confined in this place of torture; two were speedily liberated from their cruel bondage; the other, a very valuable horse, was allowed to remain, and was constantly plunging and lacerating its chest against the glass, disfiguring and maiming itself for life, while the inquisitor, policeman, stood guarding his poor captive. If this be the kindness shown to dumb animals by our vigilant police, surely the tender mercies of the wicked are cruel.'"

## ALNWICK CASTLE: ITS MILITARY ARCHITECTURE.

THE castle of Alnwick stands upon a moderate eminence on the south bank of, and about 150 yards distant from, the river Aln, which was thus its immediate defence against the Scot. It is in distance about five miles from, and about 200 ft. above, the sea at Alnmouth. Towards the east and south the castle is cut off from the town of Alnwick by a deep ravine or combe, once the bed of the Bow Burn. This has been trimmed and scarped by art, and its upper part towards the town has been nearly obliterated by modern front of the castle, and separated from it by upfilling.

To the west is a nearly level platform in a ditch, wholly artificial, and in part filled up and covered by the stables and other similar buildings. This ditch was formerly produced along the south front, and communicated with the Bow Burn ravine. A bank of earth of modern date conceals the town from the castle on this the south-western quarter.

The walls of Alnwick town were embattled, and probably built under a licence to Henry Percy in 1434, when he constructed the Bond Gate, now standing. It is uncertain whether the town wall was independent of the castle, as at Chepstow, or abutted against its outer wall, as at Carlisle. The main entrance to the castle and its principal postern were both outside the town. The former was approached from it by a town gate, the position of which is remembered, and its name preserved, in the way called "Narrow Gate." The castle postern opens towards the river. The Lion gateway in the south wall, leading to the town and the railway station, is altogether a modern structure, but may represent a by-gate communicating with the town.

In plan the castle is irregular, and many-sided, but on the whole it approaches to a right-angled triangle, the clock-tower being the right angle; the west and south sides, terminating, the one in the Abbot's Tower, and the other in the Eastern or Ravine Tower, are 125 yards and 213 yards long; and the side towards the river, and contained between these two towers, is 226 yards. The area within the walls is nearly 3 acres; that included by the ditch is reputed at nearly 7 acres.

There is no single keep-tower. The keep is in plan an irregular polygon, set round with clustered towers, and containing a central court. This is placed nearly in the middle of the general inclosure, with which it was connected at three points: one, on the south, by a bold and lofty gallery replacing an original curtain, and which

projects 35 yards from the keep to a gate-house, which divides the eastern and western wards, and is known as the Middle Gate. The other connexions, on the north side, are two curtain walls, of which one reached from the keep 33 yards to the Falconer's Tower, now rebuilt and shifted, and had upon it the Armourer's Tower, now destroyed; and the other was a curtain, now removed, which extended 20 yards from the keep to the Postern Tower.

By these arrangements the area was subdivided into an outer or western, an inner or eastern ward, and a central open keep. There remained, however, on the north front a three-sided space, bounded by the keep and the two curtains, and flanked by the Falconer's and Postern towers. This space, open towards the river, is at present protected on that side by a low retaining terrace-wall and bastions, of very modern date. A survey of 1567 shows this side open, and no doubt it was so originally; the river, its steep bank, the keep, and the flanking towers and curtains being regarded as a sufficient defence. This disposition is, however, singular and very curious, and looks as though the engineer wished to attract the enemy to this, the strongest and most completely flanked part, by a show of weakness by the absence of an outer *enceinte*. Economy of construction could not have been the motive, for the cross curtains, in length, would go some way towards completing the broken *enceinte*.

It would seem, from existing fragments and traces of foundations, that the lines of the present *enceinte* and keep are those of the old Norman fortress. The outline is governed very much by the disposition of the ground, and the shell keep was the approved Roman way of occupying such a knoll, whether natural, as at Durham, or artificial, as at Windsor, or as here, probably a very slight addition to a natural knoll. A distinct ditch, now filled up, as at Cardiff, encircled the keep, and protected it from its containing wards. Towards the river this ditch seems to have worked out into a steep scarp.

The keep is at this time an open court surrounded by towers. To the south-east, the gate-house, about 40 ft. deep and 20 ft. wide, has a grand external and internal round-headed Norman arch, of 9 ft. 2 in. span, the vault between being segmental and crossed by plain chamfered ribs. The exterior arch has a double band of bold chevron mouldings within a circle of double-hatched work. The inner arch has a single chevron band, and above it a band of which the voussoirs have alternate patterns of sunk nail-heads and the heraldic "lozengy." This is the work of Eustace de Vesci, who died 1157, and may be dated 1150, though possibly a part of his "munitissimum castellum," which, according to Mr. Tate, was existing in 1135. This Norman gateway is imbedded within a complete gate-house of Henry de Percy in 1350, of which the main features are two lofty towers, which, as half octagons, flank the entrance from the eastern ward. Original shields of arms, in the Northumbrian fashion, are carved below the parapets; and upon the merlons, which are looped, are some original figures, as at Bothal and Chepstow. The archway is portcullised. The parapets are not machicolated. The vaulting of the interior of these towers is very good, and they contain in the basement the original dungeons, which are described as vaults 10 ft. square, aired by loops, while below these are oubliettes, 8 ft. by 9 ft., and reached only by trap-doors in the floor above. Over the gateway is the private dining-room.

Entering the court, the open part of which is about twenty-four yards across, on the right, in the wall, is the very curious well. Within a pointed panel are three deep recesses, also pointed, of which the centre contains the mouth of the well, the shaft of which descends in the thickness of the wall. A wooden axle crosses above it, and is fitted, in the lateral niches, with two wheels, set round with pegs, for winding up the water-buckets by hand. Above, within the panel, in a small niche, is a figure of St. James blessing the source. This curious and probably singular well was the work of the first Henry de Percy, in 1312–15; but the figure of the saint is thought to be an insertion of the last century. There is a similar arrangement over the great gate of Goderich Castle, for working the portcullis.

Beyond the well is the rear wall of the Great Hall, built by the same Percy, refitted by the first duke, and rebuilt in 1863. The vaults below, with their segmental ribbing, are original, as is part of the rear and north wall and of the bow, whence the cross curtain ran to the Postern Tower. This is still the state dining-room, 60 ft. by 24 ft., and the vaults fulfil their original destination as cellars. At this point is placed a cloister supporting a corridor, by which a bye access is given to the suite of state-rooms. This is modern, but is a manifest improvement, and in full keeping with the building. The original entrance to the hall was six open steps from the court.

Next beyond the hall, pointing to the north-east, is a tower, once the kitchen and scullery, but rebuilt for the second time in 1856, and now the drawing-room, 45 ft. by 22 ft. Beyond this, along the north-east front, are the saloon, 42 ft. by 22 ft., and an ante-room, 22 ft. by 22 ft., built 1750–86, but newly fitted up. Next to these, and forming the north-west angle of the keep, is the Prudhoe Tower, the principal tower in the fortress, upon which the flag is hoisted. This contains the library, 55 ft. by 24 ft., and presents two grand bays to the east and west, with a deep re-entering angle between them. This also is modern.

Next, on the west front, follows the chapel, built in 1856, a rectangular tower of bold projection, one principal floor, and a high-pitched roof. The two angles are cut off, so as to form a polygonal apse. This conventional east end points, however, south-west.

Then, facing to the south-west, follow two half-round towers, rebuilt 1750–86, containing state bedrooms, and connected by a short curtain, within which is a dressing-room. Finally, between these and the gatehouse, completing the circuit of the keep, and projecting due south, is the gallery, having on the first-floor a breadth of one line of five rooms and a corridor, and below, the middle gateway. The rooms are the private apartments of the duke and duchess, and a communication with the kitchens. The gateway, which has a portcullis, is of the date of 1309–15, and built into the south curtain, from the outside of which it projects as a mural tower. The gallery replaced a curtain about 1760, and was rebuilt 1856. The battlements of the gatehouse were probably added about 1407–55.

The entrance to the state apartments is in the central court, beneath the arched vestibule, at the north-west corner. From this a grand flight of steps ascends to an interior vestibule, and thence, by a second flight, to the guard-chamber, which opens into the state-rooms. These are all on the first floor, the basement being occupied by servants' rooms.

Although the greater part of the keep has been rebuilt in the last and the present century, it still is composed of the seven towers of the early Percies, shown in the plan of 1567, and much, especially of the basement, is old; and what is new is arranged with a close general regard to the older, and, indeed, in many parts Norman, plan. The exterior ditch of the keep is partially filled up, and of course the draw-bridge of the inner gate has been removed. A portcullis remains.

Of the general and exterior *enceinte*, the most complete and striking portion is the western gateway, a very fine and unaltered example of a gate and barbican of the Edwardian period, 1312–15, in its simplest form. The barbican, about 55 ft. long by 32 ft. wide, is entered by a large round-headed arch, between a pair of square flanking buttresses, corbelled out above into two turrets, also square. Over the entrance in a sunk panel is a large Percy lion, with their motto, "Espérance." The arch leads into a passage, 55 ft. long by 10 ft. wide, for the first 20 ft. vaulted, but afterwards open to the sky. This lies between very lofty side walls, embattled each way. On the left, a small side-door led to the counterscarp of the ditch; also on the left, another door opens into a mural stair ascending to the battlements. In front is the portal of the gatehouse. This barbican crosses the ditch, now filled up. Besides an outer drawbridge, over a loop of the main ditch, it had an inner bridge between its lateral walls, dropping from the gatehouse. This is mentioned in the survey of 1538, and was filled up in 1567. The parapets are without machicolations, and the embrasures have no mouldings. The merlons are not looped, and the figures placed upon them date only from 1750–86. Probably in advance of the ditch of this barbican was a barrier or palisade of timber, and the level space in front, commanded by the walls of both town and castle, is what was usually employed for jousting matches or military duels. The adjacent river was a sufficient security against surprise.

The gatehouse, of which the barbican is the covering, is a rectangle 40 ft. deep by 45 ft. broad, of slight internal and bold external projection, and presenting to the field two half octagonal towers. The passage is vaulted, and has the usual defences of a portcullis and gates. The portals are round-headed. There are lateral lodges, entered one from the passage and one from the court.

Entering the court, the curtain on the left, of considerable height, has Norman foundations, 1150, and an Edwardian superstructure, 1350. Outside a strong course marks the base of the parapet, and the embrasures have a decorated moulding carried all round. The wall extends to the Abbot's Tower, but upon it is a small rectangular mural tower, called the Avener's Tower, 1309–15. The Abbot's Tower, of the same date, caps the north-west angle. It is rectangular, and of three stages, the lowest being vaulted, and ribbed with segmental arches, as in the Constable's Tower, and below the Great Hall. The third stage rises clear of the wall, and is reached by a well stair, which occupies the north-east angle.

From this a short curtain of mixed date, 1150 and 1350, with a low salient, extends to the Falconer's Tower, also rectangular, rebuilt, though not exactly in the old site, in 1856, and from which a modern curtain wall runs up to the Prudhoe Tower of the keep. Upon this wall stood the Armourer's Tower, also rectangular, destroyed in 1856, to improve the view from the library. The removal of this and the Falconer's Tower are said to have been the only intentional subtractions made from the original military works of the castle.

Returning to the west gate, the curtain on its right extends, past the west Garret Tower, to the Clock Tower, all rebuilt 1750–86. The latter is circular, with a flat gorge and keel-shaped salient, and caps the south-west angle. Outside the last-named curtain, and reached through it by a gateway, are the stable courts, riding-school, and guest-hall, 135 ft. by 35 ft., by 25 ft. to the spring of the open timber roof, a very noble stucture. These buildings are of modern date, 1856.

From the clock-tower the south curtain supports, on its outside, the estate offices. Part of this curtain is 1750–86; part 1309–15. This latter part includes the Auditor's Tower, 1770, of which the square rear projects into the court and the half-round front outside. Beyond this is a bit of Norman curtain, 1150, against which, on the outside, is built the modern kitchen, and above which a modern corridor communicates between the duke's room and the record-room in the Auditor's Tower. The treatment of this part of the structure by Mr. Salvin deserves especial notice, from the happy combination of the features of the Edwardian age with the appliances of the present day. The kitchen, with much to remind the visitor of Durham and Avignon, is as a whole superior to either, and is, besides, a model of culinary arrangement. These offices, originally within the keep at the east end of the hall, were placed here by the first duke, but were recast and rebuilt by Duke Algernon.

Formerly there stood in the west ward the exchequer and the stables. The exchequer was a large rectangular building, applied to the north limb of the west gatehouse, and like it embattled. The two ranges of stabling stood a little within and parallel to the curtains next the clock-tower. These buildings, shown in the survey of 1650, were removed probably about 1755.

Traversing the middle gate, in front is the eastern or inner ward, and on the left the inner or gatehouse of the keep. On the right, outside the curtain, is the steward's room, and beyond it the Warder's Tower, mentioned in 1567, but altogether remodelled and rebuilt in 1860 upon a work of 1770. It now contains the lion gateway, leading to the gardens. Below the gatehouse is an ale-cellar, and above, one side of it, attached to the offices, the confectionary.

Beyond, the line of the curtain is irregular. About the salient it is Norman, 1150, and a very good example of the rough walling of the age. Upon it is the east garret, 1309–15, and it ends in the Ravine tower, the most eastern work of the castle, and capping an acute angle of the *enceinte*. This is a good-sized round tower, with a well stair at its junction with the curtain. It has been much repaired since its foundation in 1309–15. It is defended by the ravine, whence it derives its name.

From hence the curtain trends to the north-west, being in great part Norman, but repaired

at what is called the "Bloody Gap." Beyond this is a garret bartizan, called Hotspur's Chair. It was the gorge of a half-round tower, now removed, but shown in the plan of 1650. Beyond this the curtain is again mixed Norman and Decorated of 1312–15 to the Constable's Tower. This is a strong half-round tower, capping a flattish salient to the north-east. It has an exterior entrance by stairs to each of its three floors. From this a short curtain, 1150, leads to the Postern Tower, 1312–15, rectangular, pierced below by the vaulted and portcullised passage of the postern, and vaulted also on the first floor. This tower is a fine example of a Northumbrian military building of the Decorated period. The arches are round-headed or segmental, and it has in its rear wall a remarkable two-light window, with a transom, and in the head a foliated circle. There is also a very perfect garderobe with external shoot. From this tower, a curtain, now removed, ran upwards to the bow of the hall tower of the keep, and thus completed the defences of this ward. The original postern passage is filled up, or nearly so, with earth, but by the side of the tower a way leads to a terrace walk between the keep and the river, and extending to Falconer's Tower.

The eastern ward contained the castle chapel and the conduit, supplied with water by lead pipes from an exterior spring called Howling Well. The chapel, a considerable building, stood detached near the Bloody Gap, and was removed in 1755. The ecclesiastical establishment seems to have been on a respectable scale, and included chantry for the performance of the obits of the family. In this quarter also stood the brew, bake, and slaughter houses, for the use of the garrison.

Alnwick Castle is probably the finest extant example of a Norman castle of this type, having an open keep and a complete *enceinte*; for although most of the present buildings are either of the fourteenth or the nineteenth century, the plan is certainly Norman, and certain detached portions of the construction. It seems also that the keep was never a mere shell, like Cardiff or Arundel, but was always set about with towers and provided with a handsome gatehouse. A remarkable feature is the use of the round-headed and the segmental arch in the Decorated period. This is a local peculiarity, and found in other works of the same age and neighbourhood. The very free use of stone warriors upon the parapets, carried to an absurd extent in the repairs of the last century, is also remarkable. They are seen at Bothal, and in Edwardian works, both at Caernarvon and Chepstow, but by no means so freely distributed as here. They were obviously intended for ornament only, and of all the figures that of the eagle at Caernarvon is the most appropriate. No archer would or could have stood on the crest of the parapet. Most of the later figures were very properly removed by Mr. Salvin.

There is found upon the battlements of both walls and towers, in various parts of the castle, a convenient arrangement for slinging a moveable wooden shutter in the embrasures, so as to defend the warders from a Scottish shaft, and from the scarcely less keen edge of the bleak winds of the Border. The shutter hung horizontally, like a port-lid, but from the trunnions, of which one rested in a round hole in one merlon, and the other in a similar hole, terminating in a groove in the other, so that the shutter hung freely, and could be lifted in and out if necessary. The arrangement is precisely that applied to the roller of a round towel. Traces of this arrangement remain in various parts of the castle. A perfect example is seen on the barbican. It may also be seen on the east wall of Goderich.

The officers forming the staff of this castle, as a civil residence, in 1567, were the constable or governor; the porter of the outer gate; the greive, or executive officer, or bailiff; the receiver or auditor; the feodary, who looked up the services and tenures; the steward, learned in the law, who administered justice; the clerk of the courts, who engrossed the rolls and kept the records; and the foreign or outer bailiff, who collected the castle-guard and cornage money, and summoned the tenants and suitors. The annual payment to the whole was 58*l.* 18*s.*

Looking to the character of the country, so charged with traces of early military earthworks, and to the strong and well-defined natural position of Alnwick, it seems probable that it was occupied as a camp by some of the tribes who, from a very remote period, made this border their battlefield, and whose defences are still visible in eleven distinct earthworks within a very short distance of the town. If so, they would necessarily have placed their defences to the north and east, upon the lines of the present castle. The interior eminence would certainly have been their citadel, and the trench, completing their security, would most conveniently have been carried along the general direction of the western front, so as to connect the head of the Bow Burn with the Aln, and thus complete the seclusion of the peninsula. Such a site, so defended, was not uncommonly constructed or adopted by the Northmen and Saxons when they became settled, and they would have placed the timber and palisaded mansion of their thane upon the central entrenched knoll.

Probably the Norman Gilbert Tysen, of cloudy memory, who is the reputed pioneer of the Conquest in these wild regions, found and contented himself with some early kind of timber fortress, for the earliest traces of masonry that remain *in situ* or have been extracted from the walls, though Norman, are of late character, and attributable to Eustace Fitzjohn, who married Beatrix, daughter and heir of Ivo de Vesci, who is thought to have married Tysen's daughter. Eustace, called De Vesci, flourished under Henry I. and Stephen, and died in 1157. He was a likely man to have constructed a great castle, being a baron of considerable power, sheriff of Northumberland, and founder of the abbeys of Alnwick and, in Yorkshire, of Malton. Also he must have felt the want of a strong place, for, in his days, in 1135, Alnwick Castle was taken by David I., of Scotland, in the interest of the Empress Maud.

Eustace no doubt built, in the first half of the twelfth century, a polygonal clustered keep upon the knoll, gave it the gateway we still see, and placed his residence within. Traces of his walls are said by Mr. Tate to have been discovered when the last rebuilding was being executed. No doubt also he dug or cleared out the moat round the keep. To him also must be attributed the general wall of the *enceinte*, and possibly the ditch outside it; and this would have been strengthened by mural towers, many of which must have stood where their successors are now placed. De Vesci's work is indicated by the stones being mostly square blocks of moderate size, laid in courses, but in beds more or less wavy, as though the mason used neither line nor level. The joints are open. Beyond question De Vesci constructed a castle in keeping with his wealth, and worthy of the chief baron of the Border.

In July, 1174, William the Lion, on his way back from an invasion of Cumberland, found himself, to his surprise, before Alnwick. William, son of Eustace de Vesci, attacked him. He was unhorsed, captured, and sent into England, and beyond sea, to prison. Eustace, son of William, succeeded in 1190, and was visited by King John, 12th February, 1201, and 24th April, 1209, when the king received at the castle the homage of Alexander, king of Scotland. Four years later, May 14th, John, the king, ordered Philip de Ulecote to demolish the castle of Alnwick,—a mandate which could scarcely have been obeyed, seeing the king himself was there 28th January, 1213, and 11th January, 1216, no doubt unwelcome visits, for Eustace was a Magna Charta baron. He met his death from an arrow before Barnard Castle in the last year of King John. Henry III. visited Alnwick 23rd September, 1256, and Edward I. was the guest of John de Vesci there 30th April and 1st May, and 16th and 17th August, 1291, and 16th August and 13th and 18th December, 1292; and again 22nd, 23rd, 24th, 25th, 26th, and 27th September, 1296; and 26th and 29th June, 1298.

The Barons de Vesci became extinct in 1297, by the death of William, seventh Baron, when the castle and barony were acquired, it is said, to the fraudulent exclusion of the natural son, by Antony Bec, the warlike Bishop of Durham, by whom, in 1309, 3 Edward II., they were sold to Henry de Percy, the representative of a warlike family, whose advent forms an important era in the history of the Border. Percy, as the leader of the Northern barons, made Alnwick his residence, and although in possession only for five years, seems to have rebuilt much of the fabric, the rest being completed by his son of the same name.

The Percy Castle, laid out nearly upon the Norman lines, presented very nearly the appearance of the present structure. The authorship of the inner gatehouse is established by the escutcheon of Clifford on its walls, the second Henry de Percy having married a lady of that house. To the first half of this fourteenth century may be attributed, as has already been pointed out in detail, nearly all the leading features of the castle, as it stood at the incoming of the first Duke. The Percies, though they maintained the reputation of Alnwick as the great Border fortress during nearly four centuries, do not appear to have materially altered the fabric of the two earliest lords. They received here Edward II. in 1311 and 1322, and Edward III. in 1335, but the later earls were much at Petworth, and in Yorkshire; and upon the death of the 8th earl, in 1537, and the attainder of his brother, the family ceased to reside at Alnwick, and the castle was neglected. The Percy line ended in Elizabeth, daughter of Jocelyn, the 11th earl, who, 30th May, 1682, married Charles, Duke of Somerset. Of their children, two had issue, Algernon and Catherine, who married Sir Wm. Wyndham, and eventually conveyed to that family the Percy estates at Petworth, Egremont, and Leconfield.

Algernon Seymour, Duke of Somerset, and by creation Earl of Northumberland, left one child, Elizabeth Seymour, who inherited Alnwick, and married Sir Hugh Smithson, created Duke of Northumberland, and ancestor of the present family.

A survey of Alnwick in 1567 shows the decay then to have been very considerable, and as the Seymour lords preferred their paternal residence, Alnwick became almost a ruin. From this it was redeemed by the first duke, who, under the advice of Adam, restored, and in part rebuilt the keep; and although he fitted up the interior with plaster and frippery, made the exterior sound and good, and, on the whole, in keeping with the character of the place, and with what remained of the ancient buildings.

Matters so remained until the accession of Duke Algernon, better known as Lord Prudhoe, a naval officer, and a good man of business, who had travelled much, and possessed a cultivated taste, and was of a truly noble and magnificent disposition. While foremost in works of public usefulness connected with his estates, county, and profession, and careful to drain his lands, rebuild the cottages of his labourers, restore the local churches, and provide life-boats for his dangerous coast, he, under the sound advice of Mr. Salvin, almost rebuilt the castle, preserving with scrupulous care all that admitted of preservation, and adapting his new work to the period of the first and second Percy, the founders of the later castle. Having thus restored the great fortress of the Border, with strict regard to the rules of military architecture, he proceeded, under the advice of Canina, to fit up the interior in the style of an Italian palace. The contrast afforded is certainly extreme, and the attempt, on so costly a scale, was hardy; but the adaptation of the fittings to the irregular plan of the rooms is so well conceived, the materials employed are so rich, and the execution of the details is so skilful, that it is difficult to regard even so great an incongruity as other than a distinguished success.

Much attention has of late years been paid, and by very competent persons, to the history of this castle. Grose gives some particulars, now very valuable; but this and the castles of Warkworth and Prudhoe have been illustrated by the late Mr. Hartshorne, and are treated of also by him with great success in the Northumberland volume of the Archæological Institute. More recently Mr. Tate has handled the subject of Alnwick castle with both skill and accuracy, in his admirable history of the barony of Alnwick, now just completed. In the above sketch free use has, to some extent, been made of the above materials; but the object of the writer has been to treat solely of the fabric of the castle, and that from a military point of view.

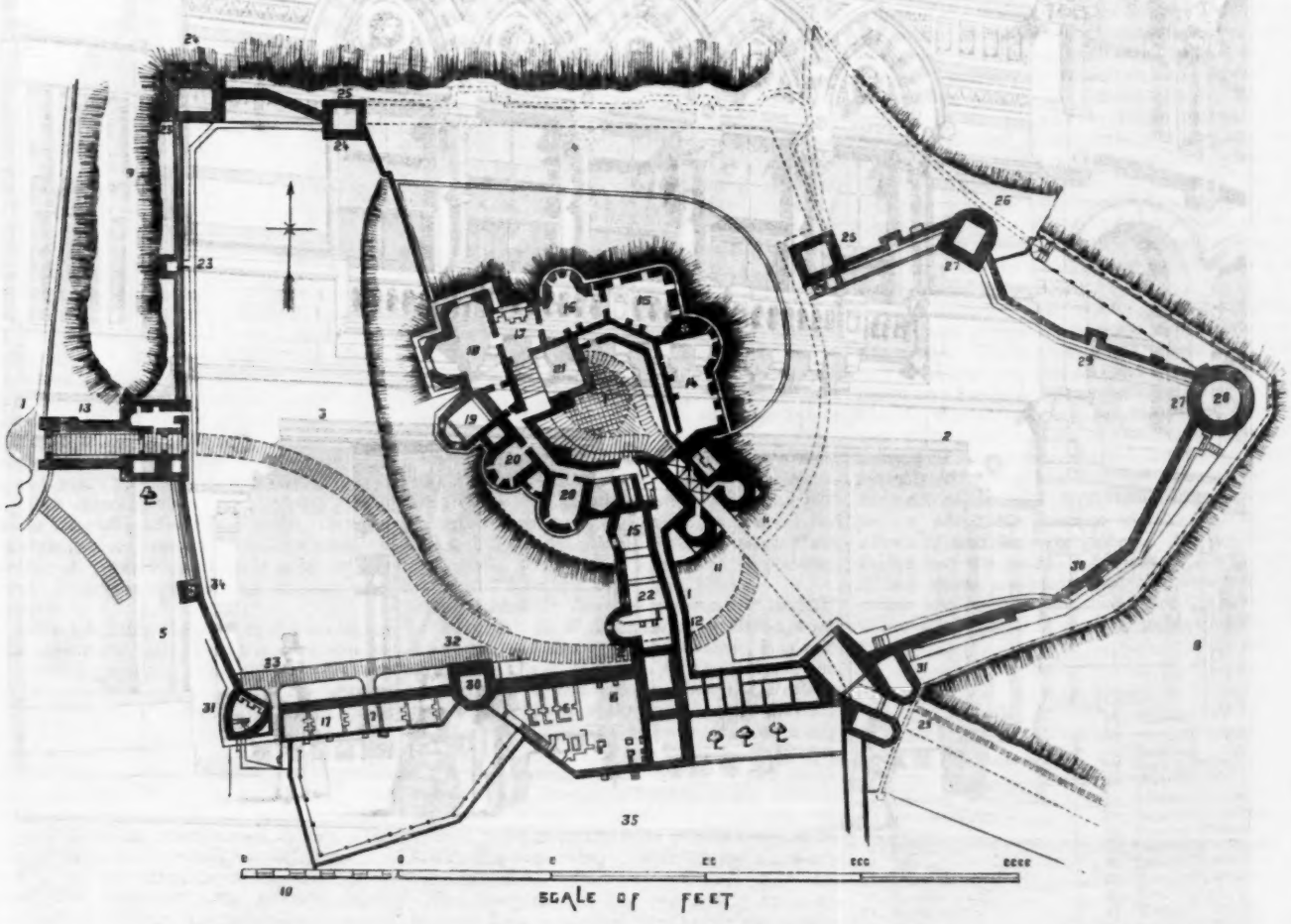
C.

REFERENCES.

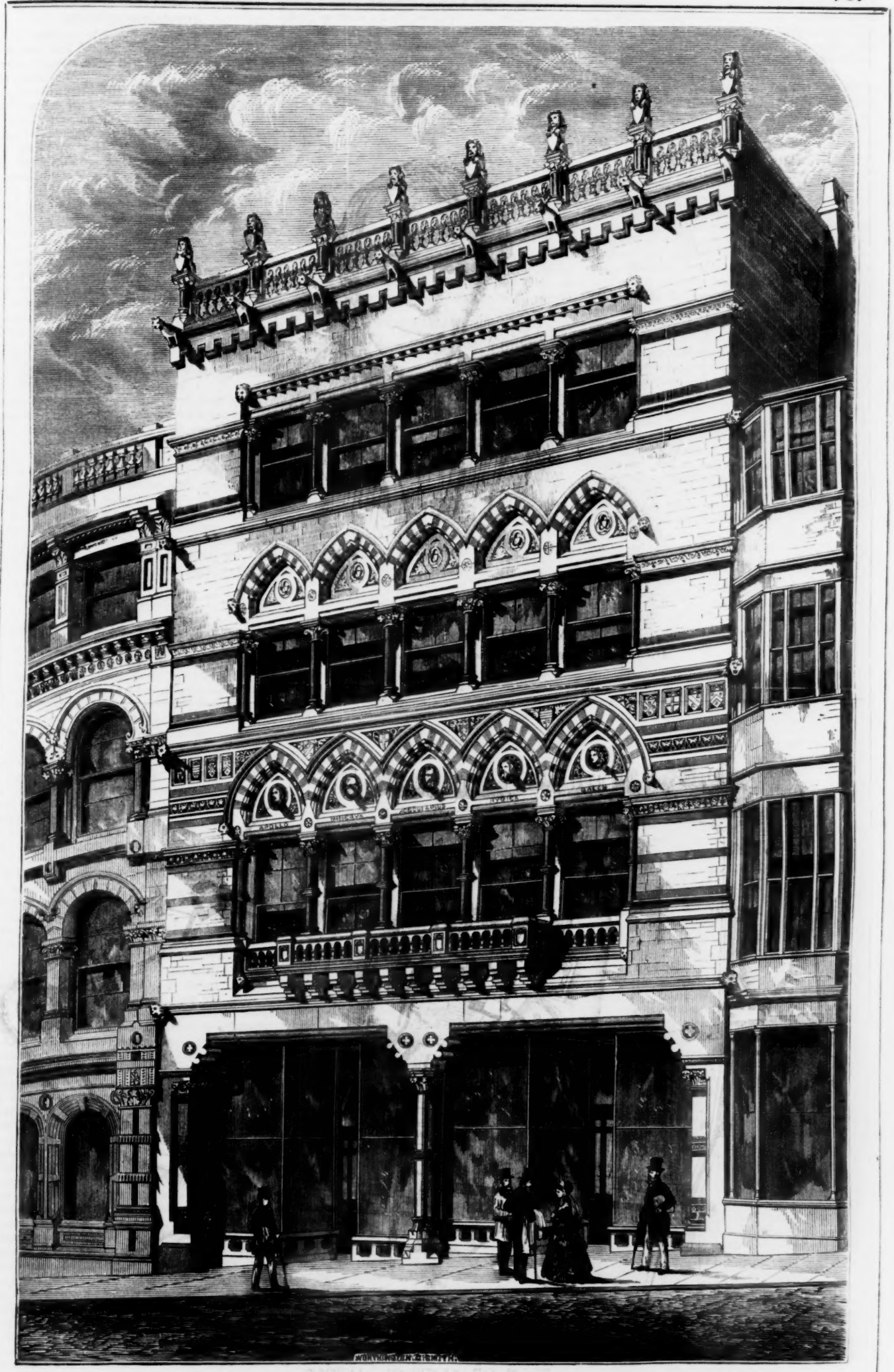
1. Donjon.
2. Inner Ward.
3. Outer Ward.
4. Terrace.
5. Stable Courts.
6. Kitchen.
7. Estate Offices.
8. Ravine.
9. Ditch.
10. Tower.
11. Inner Gate.
12. Middle Gate.
13. Barbican.
14. Hall.
15. Withdrawing-room.
16. Music-room.
17. Ante-room.
18. Library. Prudhoe Tower.
19. Chapel.
20. State Bedroom.
21. Entrance.
22. Spur Gallery.
23. West Garret.
24. Abbot's Tower.
25. Falconer's Tower.
26. Postern Tower.
27. Constable's Tower.
28. Ravine Tower.
29. Hotspur's Chair.
30. East Garret.
31. Warder's Tower.
32. Auditor's Tower.
33. Clock Tower.
34. Avenue Tower.
35. Garden.

MR. SYDNEY SMIRKE, R.A., F.S.A.

*Architect of the New Galleries for the Royal Academy, Burlington House, London.*




PLAN OF ALNWICK CASTLE.



STREET ARCHITECTURE, BRISTOL: SHOPS IN HIGH STREET.

Messrs. Ponton & Gough, Architects.

## STREET ARCHITECTURE: BRISTOL.

SHOPS IN HIGH-STREET.

The amount of building that has been done in Bristol and Clifton within the last ten years is very surprising, as well in the shape of banks, insurance offices, hotels, and new shops in the city, as of countless detached and semi-detached residences in its beautiful suburb. Members of the Social Science Association now holding congress there, and whose knowledge of Bristol may be of early date, can scarcely fail to be impressed with the remarkable change apparent. Alterations, too, in the thoroughfares now about to be made, and of which our readers have heard, will still further alter and improve the aspect of the city. As a natural result, one that always follows public improvements, individuals go to work in the same direction, and endeavour to improve their separate holdings. The two shop-fronts in High-street, of which we give a view in our present Number, afford instances of the extent to which the desire to ornament is carried. These were designed by Messrs. Ponton & Gough. The intention of the architects was to show the constructional means used for the support of the building above the shops, and to introduce as little masonry as possible, before the windows of the upper rooms.

The rooms above the shop are about 24 ft. in depth from the façade, and notwithstanding the deep recessing of the glass line, ample light is admitted. The front is of Bath stone, with shafts, bonds, and voussoirs of red Mansfield and yellow magnesian limestone; sulphur inlay of various colours being introduced between the bonds on the lower story.

The window-heads on the first floor include a series of inscribed heads of ancient healers, which, like the rest of the carving, are very well executed. The parapet, with its range of sitting lions and shields, is the least satisfactory part of the composition.

## OXIDATION OF IRON IN BUILDINGS.

The question of the mode in which iron suffers from oxidation, when included in masonry, appears likely to attract fresh attention. It is a subject on which those persons who are familiar with the repairs, or even with the demolition of old buildings, are not altogether without experience. But especial value attaches to the discoveries made on the recent occasion of the examination and repair of the tomb of King Henry VII., in Westminster Abbey, from the fact that both the date of erection, and the subsequent history of the monument, are so distinctly ascertained.

After the cleansing of the statue of the Countess of Richmond, to which so much public attention was directed in last May, the curators of the tombs proceeded to examine the central monument of the Abbey, that of King Henry VII. and his queen, standing, as is well known, in the chapel founded by that sovereign, under the protection of a richly-wrought *grille*.

Not only did the effigies appear to be coated and partially corroded in consequence of long neglect, but the altar-tomb itself gave symptoms of dilapidation and decay. Joints yawned, and cracks menaced, and the general appearance was such as is often produced, in similar structures, by subsidence of the foundations. The effigies were therefore carefully removed, and carried into the Eastern apse, or smaller chapel, where they were cleaned, and that with great science. The altar-tomb itself was reverently taken to pieces, with a view to its replacement in its original integrity. It soon appeared that no subsidence had occurred. On the contrary, the tomb had been built on the finished pavement of the chapel, and the portion of this pavement which had thus been protected from wear was in a condition of great and original splendour, being enriched with a diapered pattern, partly polished, and partly pounced or frosted.

The actual cause of the dilapidation of the tomb then appeared. It was nothing but the oxidation of the only pieces of iron which had been employed by the builders. All the fittings were of copper, with one exception. At each corner of the tomb, as many of our readers will remember, sits a boy angel, in gilded copper. To keep these figures in their place copper bolts were employed, which passed through the upper portion of the ornamental work, and were secured by attachment to four plates of iron, which were built into the tomb itself, under the slab on which the effigies rested. These four iron plates, notwithstanding their protection, first by the work of the tomb itself, and secondly by the building which sheltered the tomb from the chief vicissitudes of atmospheric temperature, had developed, on either side of each, solid plates of rust, of from three to four times the thickness of the original iron. The slow formation of this oxide had acted as an irresistible wedge, riving the fabric asunder, and threatening in course of time the entire overthrow of this noble monument.

Specimens of these plates of oxide, as well as one of the original iron plates, were exhibited at the meeting of the Royal Archæological Institute, on the 2nd of July last. The dangerous metal has now been replaced by plates of copper; and the tomb has been restored to its original beauty. But the lesson as to the conduct of iron when included in masonry or in mortar, even under circumstances which might be presumed to be more than ordinarily favourable, is not one of which any prudent architect or engineer will lose sight.

## THE POPULATION OF LONDON.

According to the census of 1861, the population of London (which was 2,803,034), was nearly equal to all the towns and cities of Great Britain, containing more than 100,000 inhabitants (fourteen in all), as is shown by the following table:—

| | Population. |
|---|---|
| Birmingham | 296,076 |
| Bradford | 106,218 |
| Bristol | 154,093 |
| Leeds | 207,165 |
| Liverpool | 443,938 |
| Manchester | 338,722 |
| Newcastle-on-Tyne | 109,108 |
| Salford | 102,449 |
| Sheffield | 185,172 |
| Stoke-upon-Trent | 101,207 |
| Edinburgh | 168,121 |
| Glasgow | 394,864 |
| Dublin | 295,964 |
| Belfast | 119,718 |
| Total | 3,222,815 |

The entire population of Scotland was but 3,062,964.

The remark of a celebrated Frenchman was very apt:—"*Londres n'est plus une ville: c'est une province couverte de maisons!*" for it contains as many people as the three largest capitals in Europe together, viz., — Paris, Constantinople, and St. Petersburg, and more inhabitants than either of the kingdoms of Denmark, Saxony, Hanover, or Norway. J. B. W.

## A WORKMAN ON THE TRADE-UNIONS CONGRESS.

Sir,—An unprejudiced reader of the report of the late trade-unions congress could not but notice how entirely the delegates were dissevered from the outside world. They moved and passed resolutions which, if put into practice, would affect the whole community, and yet forgot that the public lived outside their meeting-place, and whose interests were, as a rule, opposed to their conclusions; in fact, the delegates appeared to be in the position of the man who had a memory so bad that he could not leave his home for a short distance without forgetting who he was and where he resided. It is evident that as soon as the delegates separated they would have different interests, as each one represented a different trade; and for the supply of their daily wants they would, as a natural course, buy in the cheapest and best market that which their families required for their daily consumption.

The question of a reduction of the hours of labour received great prominence, and is one of the cherished ideas of the leading unionists. The subject, like many others, looks well on paper.

I suppose there are not many workmen who would object to work eight hours per day instead of ten, and therefore to the superficialist and unthinking it is a captivating scheme, more so as the leaders try to persuade the workmen they are doing a charitable action by relieving their fellow workmen's burden and creating employment for them at others' expense. The authors of the papers were not so selfish as some people would suppose, and had no wish to do all the great work by themselves, as they appeal to employers "to abolish the present system of competition, as it is fraught with the most disastrous consequences to society." It seems the congress would fashion society after some plan of their own, and so regulate trade and manufactures as to equally divide what they thought was sufficient among employers, and limit production so that everybody should have a little of the results of labour; only it must be a very little, as it would entail a little exertion and labour upon the labourers, and under the new plan, that could not be thought of.

In the socialistic agitation, the founder of the rational or new system of sociology established Harmony Hall and Harmony Farm. All the approaches to it were laid with rare wisdom. The roads and paths were excellent, and of great beauty. Nevertheless, the delegates who met at Harmony were not harmonious. The result of so much wisdom was defaced, as the delegates could not agree to proportions. And I am afraid, that when the trade-unionist scheme is fully developed, and the scales are evenly balanced, the rank and file will not agree to proportions, as the talkers would, of course, want more than the producers; and, like the national workshops in France, and Harmony Hall in England, the schemes will fail because in theory and on paper they look sweetly pretty, but in practice they are entirely wanting.

It is said there never was a time in the history of this country when trade was more depressed, or employment more slack. And one of the rare gems of the congress was the proposal of the delegates to raise the price of labour 20 per cent., without inquiry as to what its effect would be upon the income of the country. In examining the report of the census for 1861, I find there were 177,969 carpenters and joiners in England and Wales. Professor L. Levi, in his estimate of the income of the working classes, states the average income of the workmen is 22s. 6d. per week. The average income of carpenters and joiners would amount to at least 26s. or 27s. per week. For the sake of enumeration, 5½d. per hour, may be taken as not an excessive estimate, and ten hours per week as the reduction of working time for each man. This would raise the price of joiners' work, 2,094,793*l.* 5s. per annum. And, further, there are 287,485 mechanics in other branches of the building trade, and, at the same rate of wages as the carpenters receive, it would add for operatives' wages alone 5,526,367*l.* 11s. for the cost of building in England. The labourers, of whom there are a large number, although not specially stated in the report, would add at least another million; and when employers' profits on the extra capital are accounted for, with the increased cost of material, it would add not far short of nine millions per year to the present cost of building operations. What the building trade had done others would imitate; and a rise of 2s. per week in the rate of remuneration would add 37,200,000*l.* per annum to the cost of production, and would give the finishing stroke to the prosperity and industry of England.

The trades' delegates seem to have learnt nothing from the experience of the past; they want to take society back to a period when it was the rule to fix and regulate by law the hours of labour and the rate of wages. It is related in the history of industry that guilds and corporations proved the ruin of trades in the corporate towns; "and industry took refuge in the then obscure hamlets of Manchester, Birmingham, Sheffield, and other unprivileged places." The moral of which it would be well for the bulk of workmen to understand; and, I am sure, if they did they would to a man repudiate the false and pernicious blindness of the leaders of trade-unionists. Supposing the reduction of the hours of labour could be carried to a successful issue, and that the moderate computation of 57,000,000*l.* were added to the yearly cost of production, and trade-unionists met at the Crystal Palace to raise a song of triumph for their victory, their success in the end would prove more lamentable than a defeat, as they could not force the foreigners who buy our goods to receive them at the enhanced price, nor could they force the public of this country to find them employment. Some trades have already found to their cost that there is no royal road to employment. The engineers and ironworkers, for instance, have seen their accumulated fund yearly wasting, in spite of the extra levies and contributions; and they live in hopes that something may turn up to revive a failing trade. The self-made leaders of the working classes at Birmingham complained about the employers wishing to grow rich in a few years. But they ought to have known that in trades which are continually agitated by strikes, and where the employer is not certain for a month at a time that his business will not be disturbed by a strike, he is desirous of making the most profit

in a short time. And if the strike for the reduction of the hours of labour be successful in several towns, it is the inauguration of a general agitation, and will in the end result in the total removal of many industries from this country.

Working men have for a long time been pursuing a suicidal policy, as they have acted as if capital were a patient that would bear continual bleeding, and no wound so deep that it would not heal; and before the patient was recovered, the knife was again in preparation to inflict another sore deeper than the one before. Trade-unionist leaders, with their peculiar political economy, are, it appears, still ignorant of the real cause of the higher remuneration of English artisans. It is not because England possesses more gold than other nations, but that she has hitherto possessed greater powers of production, in the excellence of her machinery and tools, and labour has been more energetic and more skilfully applied than in any other country. The statistical abstract for the United Kingdom shows that this superiority is yearly diminishing, and continual agitation is hastening it on. I intended to review the question of limiting apprentices, but must leave that and other points for another letter. JACK PLANE.

## THE BUILDING TRADE AT SCARBOROUGH.

LIKE many other places which furnish a home for those in pursuit of pleasure and health, Scarborough, there can be no doubt, has been overbuilt, and as a result the building trade is not at the present time in a very flourishing state. There can, however, be no disputing the fact that the builder and the architect have left some good marks of their handy work in times past, as well as at no very distant period. We need only mention the erections at New Scarborough, the Cliffe Hotel, with its 300 bedrooms, thirty private sitting-rooms, together with all the other necessary rooms and conveniences, or point to the bridge, which is 414 ft. in length, and 75 ft. in height, to call to remembrance a few of the works which have been completed in the town. At the present time there does not, however, seem to be much doing in the building trade. A few new erections are rising up, amongst which is a structure that has been built on an eminence overlooking the north sands, which will henceforth be known by the name of Cromwell House. The builders have been Mr. Harrison, of Scarborough, and Mr. Grey, of York. The structure, which has a flat roof, is of brick, and has a pleasant appearance. Another erection, similar to the one just named, but not in the same style, is in the course of erection in the same locality.

## AMSTERDAM EXHIBITION.

ACCORDING to Mr. P. L. Simmonds, the British Commissioner at Amsterdam, out of 210 British exhibitors 150 have received rewards, including 15 diplomas of honour, 10 gold medals, 36 silver medals, 28 bronze medals, and 12 honourable mentions. Besides these, exhibitors not coming properly within the scope of the Exhibition (owing to their goods being of a different or expensive character, and therefore not strictly suited to the working classes), received 17 diplomas of excellence and 3 extraordinary mentions. The list includes,—

*Class I.—Houses and Fittings, &c.*

D. Anderson & Sons, Belfast—Roofing felt—Honourable mention.
Engert & Rolf, London—Asphalted roofing felt—Bronze medal.
T. H. Phillips, London—Gas cooking-stove—Bronze medal.
Partridge & Co., Birmingham—Gas brackets—Bronze medal.
Jas. Harding, London—Roofing felt—Silver medal.
Doulton & Co., London—Drain-pipes—Mention extraordinaire.
Gallichan & Co., London—Drain-pipes—Mention extraordinaire.
W. S. Adams & Co., London—Cooking-stove—Mention extraordinaire.
Walker & Strangman, London—Washing boiler—Honourable mention.
C. J. Philp, Birmingham—Chandeliers—Silver medal.
Moule's Patent Earth Closet Co., London—Earth closets—Bronze medal.
J. E. Watson, Newcastle—Plans of workmen's dwellings—Bronze medal.
J. Cliff & Son, Wortley, near Leeds—Drain-pipes—Diplome d'excellence.
Duley & Co., Northampton—Kitchener—Mention extraordinaire.
G. Glover & Co., London—Gasmeters—Diplome d'excellence.
W. Blews & Sons, Birmingham—Gasfittings—Diplome d'excellence.
John Brogden & Sons, Bridgend, Glamorgan—Iron—Gold medal.
Maw & Co., Broseley—Mosaic tiles—Diplome d'excellence.
Society for Improving the Condition of the Labouring Classes, London—Drawings of cottages—Diplome d'honneur.
Central Cottage Improvement Society, London—Drawings of cottages—Diplome d'honneur.

*Class VII.—Societies, &c., for Promoting the Well-being of the Working Classes.*

Henry Briggs, Son, & Co., Whitwood—Gold medal.
Postmaster-General, London—Diplome d'honneur.
Central Co-operative Society, Rochdale—Diplome d'honneur.
Society of Equitable Pioneers, Rochdale—Diplome d'honneur.
Thomas Twining, Twickenham, London—Diplome d'honneur.
Working Men's Club and Institute, London—Gold medal.
Working Men's College, London—Gold medal.
Working Women's College, London—Gold medal.
Rochdale Co-operative Corn-mills Society—Bronze medal.
J. Brucciani, London—Bronze medal.
Gustav Meinhardt, Birmingham—Bronze medal.

## UNITED PRESBYTERIAN CHURCH, DALKEITH.

THIS church was the subject of a limited competition, when the design of Mr. R. Thornton Shiells was chosen by the Committee.

Accommodation is provided for a congregation of 700. There is a gallery at one end of the church opposite the pulpit, and in the rear is placed a session-house and vestry, the former of which serves also as a Sabbath school. The interior is fitted up with deal benches, and has an open timber roof. The pulpit is in the form of a platform of deal stained and varnished, and the whole of the fittings are of a plain and unassuming nature.

The cost of the building, exclusive of the spire (135 ft. in height), is about 3,000*l.*; but it is expected that funds will be forthcoming to complete the design, as the building occupies a prominent site in the town which already possesses two fine spires.

## RAILWAY MATTERS.

TRAINS are often placed in situations of danger where the break-power at the command of the guard and driver is insufficient to meet the emergency. It is obvious that the difficulty would be overcome if the break-power could be applied *equally to every carriage* composing the train. This, Mr. John Clark, of the firm of Messrs. Wilken & Clark, of London, is said to have succeeded in accomplishing. He has invented an apparatus by which a continuous break, self-applied, is attached to every carriage of the train, so that in case of any portion of the train breaking away on an incline, the break is at once brought into operation by the accident alone, and the carriages brought to a standstill. This power is obtained by passing a small chain from the break-van beneath the bottom of the carriages the whole length of the train, and this chain is attached to the breaks. While the train is running the chain is kept tight by the guard. To apply the break throughout the train all that is necessary is to slacken the chain; and the same result follows if an accident should snap the chain at any part, independently of any action on the part of those in charge. When the break is applied no jolt follows, and, unlike most other breaks, the power of this new apparatus increases from the moment it is applied. A train of Midland carriages has been fitted up by the inventor with his apparatus, and an experimental trip was made a few days ago on a heavy portion of the line near Buxton. Amongst other measures resorted to for testing the value of the invention, the driver was ordered to run down hill at full speed, and, after attaining a speed of 55 miles per hour, he slipped the coupling and left the train uncontrolled by the engine. The snapping of the connecting chain at once applied the break, and we understand with such success that in 27 seconds the train was brought to a standstill after running 330 yards. The maximum power of the break was also tested on a similar descent. The engine set off at full speed, with all steam on, when, the break being applied, engine and train were brought to a standstill in 1,000 yards. The trials are said to have given satisfaction to the officials of the company, who were present to watch them. This experimental train has been running between Leeds and Bradford, and is so completely under control that the loss of time by stoppages at stations has been materially lessened. The *Leeds Mercury* is of opinion that still more satisfactory results would be attained if the break power were placed in the hands of the driver, so that he could time its application with the shutting off of the steam when about to stop.

## LONG-LANE, WEST SMITHFIELD.

MORE than 100 silver coins, consisting of crowns, half-crowns, and shillings, of Elizabeth, James I., Charles I., and Charles II., were found in an earthen pot, on Monday last, in excavating for the new houses about to be built for Mr. Hayne, on the north side of this street. The coins were quite black, and had been burnt, probably in the Great Fire of 1666, which consumed the old Griffin Inn, then standing on this spot, portions of whose foundation walls, consisting of the peculiar thin red-bricks in use three and four centuries ago, have been exposed. The pot containing the coins was found amid the ancient foundations referred to. The frontage of the new houses will be set back 12 ft., so as to be in line with the south front of the New Meat Market. Long-lane will thus be widened; the City Corporation having determined, by taking advantage of the rebuilding of the houses, to begin this much called-for improvement.

## SCARLET FEVER.

THERE appears to be a complete epidemic of scarlet fever, not only over all the metropolis, but throughout the country. As regards London, it has more especially prevailed in Bermondsey, Brompton, Whitechapel, and the Holborn district. In the week ending 25th ult., there were 191 deaths from the fever in the metropolis, which implies a great deal of illness. The Registrar-General says it is "more fatal than ever:" the weekly deaths had been 170, 179, 178, and 191.

Doubtless the dryness of great part of the summer, and the consequent deficiency in the natural process of washing away all sorts of filth and decomposing organic matter which rain effects, have tended to cause this fever to spread. It only behoves us, however, all the more strictly to aid nature in such a strait.

The medical officers attached to the various boards of works of the metropolis have, at several meetings which have been recently held, drawn attention to the alarming prevalence and spread of the fever. Particular attention was directed in the Holborn district, to its existence in Eagle-street, Red Lion-street, where several deaths had resulted from it. Mr. Hutchinson, one of the members, said more deaths had occurred in Eagle-street from scarlet and typhus fevers than in any other part of the district. He attributed this fact to the presence of effluvia which came from a slaughter-house in Yorkshire Grey-yard, as on one occasion when he visited the place he found 2 ft. of water and putrid matter, which came from the slaughter-house, extending from a gully into the yard. The smell was most offensive, and likely to breed any fever. The blood from the slaughter-house ran into the gully, instead of directly into the sewer, and it got congealed. He proposed that the occupant of the slaughter-house be forthwith required to drain directly into the sewer. The dunghill, also, which was in the yard, should be cleared away more frequently. The proposition was seconded by Mr. Padman, and Dr. Complin said the houses should be thoroughly washed with lime, and fumigated. Dr. Gibson thought carbolic acid would destroy the infection. Mr. Walker said that scarlet fever was raging to a fearful extent throughout the metropolis. It behoved them to adopt all requi-

site steps for the obviation of the spread of the disease as much as possible. Dr. Gibson reported that during the five weeks of the recess seventeen deaths were recorded from scarlet fever. The general mortality had been in excess of the average for the corresponding weeks of the past ten years.

The medical officer for Bermondsey reports eighteen deaths from scarlet fever during the fortnight ending September 11. On being asked in what particular part of the parish the fever prevailed, the medical officer said it was all over the country; and, in reply to other questions, said that nothing could be done by the vestry to prevent its spread. He gave advice to the persons who had families where the disease prevailed. The reason, in his opinion, the fever was so prevalent arose from the fact that parents would not take sufficient care to keep their children away from those who were affected.

## EXTENSION OF THE NEWCASTLE WATER WORKS.

The first sod has been cut in connexion with a great new reservoir at Hallington, among the wild hills of South Northumberland, for the Newcastle and Gateshead Water Company. The proposed receptacle is intended to be used for the storing of the clear and pure water which ripples through the water-courses of the district, in order that, in seasons of great drought, the residents along the banks of the Tyne may have a pure reserve for the periods of their necessity. Mr. Bateman, the engineer, was instructed to search for a site for the new undertaking, and, as the company had for long been draining an area of 17,500 acres near Hallington by means of a large open aqueduct, a natural basin in the locality was ultimately chosen as possessing the greatest number of advantages. The reservoir, or the Hallington Lake as it is termed in the Act of Parliament, will cover 160 acres of land, and contain the enormous quantity of 600,000,000 gallons of water. This is 70,000,000 gallons more than the whole of the existing supply combined, and should be sufficient, even if the operations of the company are extended to Tynemouth, to meet all the legitimate requirements of the present and next generation.

The greatest length of ground to be submerged is about a mile and a half, and the only embankments required for confining the water in this space will be three in number. The principal or central embankment—through which the water will be drawn into the existing aqueduct—will constitute the most formidable obstacle in the way of the contractor, Mr. J. B. McGuire, of Manchester; but by means of a puddle trench or wall, and a good water-tight foundation, this experienced gentleman expects to surmount any difficulties that may arise from the marshy character of the land to be worked upon. The puddling wall will be 16 ft. wide at the bottom, tapering to 8 ft. at the surface, and will be supported by the bulk of the soil removed from the interior of the workings; while, as an additional precaution against the angry dashing of the waters in stormy weather, the interior slopes will be faced with an impenetrable coat of rubble pitching. The embankments contain altogether from 200,000 to 300,000 yards of earthwork, and these, as well as the interior, are intended to be ready for use in two years.

## THE ENGINEERING TRADES OF MANCHESTER.

The inaugural meeting of the Engineering Employers, Foremen, and Draughtsmen's Society, for the session 1869-70, has been held at the Mechanics' Institution, David-street. Mr. William Mather occupied the chair, and there was a numerous attendance. Mr. J. Nasmyth said the society was formed in 1856. It then numbered forty-five members. Its object was to discuss scientific and practical questions connected with mechanical trades. The members had also to contribute monthly or quarterly subscriptions, which went to form a fund to aid members who, when their active period of life was past, needed such assistance. In 1858 the members had increased to fifty-four, and the society had steadily progressed since. The chairman in the course of his address said the Government had never made the slightest effort to provide institutions for the encouragement of trades, and for increasing the knowledge of those engaged in them. Everything that had been done was attained through voluntary effort. The time had arrived when they must gravely consider their position. If Englishmen had accomplished so much under great disadvantages, what might they not accomplish by study and education and the aid of scientific knowledge? As an employer, deeply interested in keeping the trade of the country, he had not the slightest fear of the competition of foreign nations. They must regard themselves in the future more as citizens of the world. They ought to rejoice that other nations were advancing, and, instead of feeling discouraged, they should be urged by that circumstance to go on a little faster. He thought, as intelligent men, and enjoying a position in the engineering trade, which was happily free from the disputes that affected some other trades, they might exercise an influence which would bring about a better understanding between the interests of capital and labour. Mr. Hamilton Woods and Mr. R. Rawlinson afterwards addressed the meeting, the latter stating that the society now numbered 140 members, and that the money in hand amounted to 1,100*l.*

## THE PUBLIC MORTUARY QUESTION.

The sanitary committee of the Clerkenwell vestry have reported to the vestry with reference to the state of the Clerkenwell mortuary, which has recently attracted much public attention, consequent upon the remarks of the deputy-coroner for Central Middlesex as to the want of ventilation in the building, and therefore danger of injury to the health of those whose business brings them into the place. It was also stated that the bodies of the dead could be plainly seen by the occupiers of the houses opposite to the mortuary, and that therefore in front of the entrance a screen should be erected. The committee in their report state that the construction of the mortuary, which was built in 1866, had met the approval of the Government inspector, and that any faults found with it since had arisen from the fact that it was not kept in proper order.

The committee recommended that three air-bricks, with charcoal filters, be placed in the walls at each side of the mortuary; that a screen be put up outside the door; and that the surveyor be instructed to attend to the internal condition of the building.

The vestry has approved the report of the committee, and it is considered that its adoption will prevent the outrages to decency and danger to health heretofore observable at the Clerkenwell mortuary.

## NEW BATHING ESTABLISHMENT AT FOLKESTONE.

The desirability of erecting a bathing establishment at Folkestone had been frequently mooted, but nothing was practically effected in the matter until Mr. Gardiner, a local architect, in conjunction with Mr. Harrison, of the firm of Brockman & Harrison, took it in hand. Mr. Gardiner visited the principal bathing establishments in France prior to preparing the plans which he subsequently submitted, and which were ultimately adopted. It was suggested that a company should be formed, and a capital of 10,000*l.* raised in 100*l.* shares. This suggestion was acted on, and several of the leading residents of Folkestone, with Mr. Gambrill, the then mayor, at their head, formed themselves into a limited liability company, of which Mr. Gambrill became chairman. The plans prepared by Mr. Gardiner were approved of, and the contract for the erection of the building was taken by Mr. Frances for the engineering work, and by Messrs. Holdom & Powell for the building. The shares, with the exception of twenty-five, were at once taken in the locality, and have been paid up in full. The foundation-stone of the building was laid by the mayor, Mr. Gambrill, in September, 1868, in the presence of a number of gentlemen interested in the prosperity of the town. The visitors on the occasion included Baron M. de Rothschild, M.P.; the Lord Chief Baron (Sir Fitzroy Kelly); Dr. Alderson, president of the College of Physicians; and others. The building is now open to the public. It is in the Italian style, freely treated, and occupies a frontage of 117 ft. by a depth of 48 ft. On the lower tier is a large swimming and plunge bath, and also every description of medicated and "invalid" baths. The first-floor is devoted to a series of warm and cold baths,—at one side for ladies, and the other for gentlemen. The baths are so constructed that the bather can indulge in sea or fresh water at pleasure. The upper tier has an entrance from the cliff, the house being built on the slope of the hill; and here are situated subscription and assembly rooms, reading, billiard, and refreshment rooms, which are reserved for subscribers to the baths. The assembly-room is frequently used as a ball-room. One of the features of the establishment is a spacious balcony running the entire breadth of the grand saloon, from which an extensive sea view is obtained.

## NEW INFIRMARY FOR POPLAR AND STEPNEY.

An order was issued by the Poor Law Board a short time since, combining Poplar and Stepney Unions into a sick asylum district, with a view to the better classification of sick workhouse inmates. At the same time the Poor Law Board notified their intention to sanction the erection of an infirmary for the use and at the joint expense of the two unions.

The scheme was entered into with some spirit by the Guardians of the places concerned, and very soon a site was secured. It is situated at Bromley, Middlesex, abutting on the Tilbury and Southend Railway. At the last meeting of the Board of Management tenders were opened for the erection, as follows:—

| | | | |
|---|---|---|---|
| Hunt | £34,308 | 0 | 0 |
| Sheffield | 34,252 | 0 | 0 |
| Kilby | 33,755 | 0 | 0 |
| Henshaw | 33,545 | 0 | 0 |
| Ennor | 33,142 | 0 | 0 |
| Pearson | 32,749 | 0 | 0 |
| Perry & Co. | 32,739 | 0 | 0 |
| Webb & Son | 31,200 | 0 | 0 |
| Turner | 30,900 | 0 | 0 |
| Hill, Keddall, & Waldram | 30,745 | 0 | 0 |
| Nutt | 30,103 | 0 | 0 |
| Mann | 29,932 | 0 | 0 |

Mr. Mann's tender was unanimously accepted. Messrs. Harston & Harston, of East India Dock-road, Poplar, are the architects.

## ERECTION OF NEW HOUSES: NOTICES TO SURVEYORS.

At a recent meeting of the Camberwell vestry, as reported in the *Clerkenwell News*, the local sewers committee reported that they had requested the inspectors of nuisances to make a weekly report of all new houses in course of erection, with the view of discovering whether proper notice has been given to the surveyor of the same.

Mr. E. D. Rogers said it was unfortunately the fact, that there were builders who forgot, in the midst of their business, to give notice to their surveyor of their intention to erect buildings; and, in consequence, he could not examine them and see that they were properly drained; but this was a matter of such great importance that it should be attended to.

## ACCIDENTS.

*Salford.*—An accident of an alarming nature has occurred in a dwelling-house in Bow-street, off Arlington-street, Adelphi, Salford. The house is one of a kind known as single houses, consisting only of a ground-floor, with a large cellar underneath, and an upper apartment. The ground-floor had sixteen or seventeen persons assembled in it for the purpose of "waking" a dead body. The people had not been long in the house when the floor, which consisted of stone flags, supported by timber couplings, suddenly gave way and fell into the cellar underneath, a distance of at least 7 ft. or 8 ft. The corpse and the people assembled, with the furniture, were precipitated to the bottom of the cellar. A great portion of the furniture was destroyed, but, fortunately, no bodily injuries were sustained. It is stated that the accident occurred in consequence of the joists which supported the floor having been rotten, and many of the floors of the houses in the neighbourhood are reported to be in a very dangerous condition from the same cause.

*Peterchurch.*—A terrific gale of wind recently made great havoc at the parish church of Peterchurch. This old Norman fabric has been under repair since October last, and the double chancel and apse have been restored. About a month ago the work at the nave was begun, and

the south wall having bulged, and being very much out of the perpendicular, it was necessary to take it down and rebuild it (one-half of this wall had been rebuilt), the roof stripped of its tiles being strongly shored up. This roof was a massive one, consisting of twenty-three continuous oaken rafters. The wind swept every one of these from the wall plates, and whirled them into a heap of ruin into the body of the church. Most providentially the accident occurred at a very early hour in the morning, before the men went to their work. The curious old font was encircled by the huge beams, but uninjured, and the new walling and windows also escaped; but the roof of the new heating vault was smashed in, and some scaffolding and ladders broken to pieces. The bishop immediately headed a list of subscriptions for the further restoration of this ancient and interesting church with 20*l.*, an example which it is to be hoped will be followed throughout the county. About 300*l.* more are required to complete the proposed restoration. Mr. T. E. Williams, of Westminster, is the architect; and the builders are Messrs. Lewis & Day, of Hereford.

*Newcastle-upon-Tyne.*—A frightful accident has happened at the North-Eastern Company's new goods station, in course of erection at the Forth Banks, Newcastle, by which a man was killed on the spot, and another received such injuries that his death ensued within half an hour afterwards. Two glaziers were at work in the station. They were engaged in putting glass into the roof of the building, and for that purpose were on a scaffold close to the roof. While so employed one of the planks composing the scaffold broke, and the unfortunate men were precipitated to the ground—a very considerable distance.

## THE CLOCK THAT STRUCK THIRTEEN.

After reading my accustomed weekly periodical, about which I will not say anything, as words would be idle in praise of its excellent papers, I beg again to refer to the "Clock that struck Thirteen at Midnight."

Before the time of the present St. Paul's, and as long ago as the reign of Henry VII., there is on record a well-attested story of a young girl, who, going to confess, was importuned by the monk then on his turn there for the purpose of confession in the building; and, quickly escaping from him up the stairs of the Great Clock Tower, raised the clapper or hammer of the bell of the clock just as it had finished striking twelve, and, by means of the roof, eluded her assailant and got away.

On accusing him as soon as she reached her friends and home, she called attention to the fact of the clock having struck thirteen that time; and on those in the immediate neighbourhood of the cathedral being asked if so unusual thing had been heard, they said it was so.

This proved the story, and the ecclesiastic was degraded.

J. N.

## METROPOLITAN BOARD OF WORKS.

PARK-LANE: DANGEROUS STRUCTURES: GAS FROM SEWAGE.

The first weekly meeting of the members of this Board after the summer recess was held on Friday in last week, at the offices, Spring-gardens. Sir John Thwaites, chairman of the Board, presided, and the members present were—Sir W. Tite, M.P., Messrs. Thompson, Collinson, P. Taylor, Savage, Richardson, Hall, Rogers, Le Breton, Runtz, S. Taylor, Bidgood, Meaden, Freeman, Phillips, Nicholay, Hows, Fowler, Brooker, Barker, Brushfield, R. Taylor, Dalton, Legg, and Saunders.

Amongst other business which was transacted, the letter, of which we gave notice last week, from Mr. Dunster, stating that a lady, residing in the vicinity of Park-lane, was anxious to preserve Hamilton Gardens from encroachment, and was prepared, on the Board obtaining a repeal of the Act for opening up Hamilton-place, and obtaining an Act for the widening of Park-lane, by the removal of Gloucester House, to contribute the sum of 50,000*l.* towards such improvement, was read to the Board.

It was ordered that the clerk do write to Mr. Dunster, to say that the Board could not accede to the request of his client.

A report was read from the Building Act Committee, recommending that for the present the several district surveyors be requested to carry out the provisions of the Metropolitan Building (Dangerous Structures) Act, 1869, at the same scale of fees as already settled by the Board, and that it be referred to the Building Act Committee to consider and report as to any further arrangements which they may deem necessary for the proper carrying out of the provisions of this Act. Mr. Bidgood moved the adoption of the report, and the motion was agreed to.

Sir John Thwaites alluded to a paragraph which had appeared in several newspapers, to the effect that gas was being manufactured in India from sewage, and leading to the inference that the same results might be obtained from metropolitan sewage. The writer, as Sir John remarked, appeared to have ignored the fact that Indian sewage consisted principally of solid matter, whilst London sewage contained 94 or 95 per cent. of fluid matter, which would render the cost of extraction too heavy to be of any practical utility. At the same time, on the part of the Board, he wished to state that they would give every facility to persons who desired to experiment with a view of arriving at any results not hitherto attained.

## CHURCH-BUILDING NEWS.

*Walton.*—The new parish church here has been consecrated. The church, which has been erected from the designs and plans furnished by Messrs. Paley & Austin, is built of the red sandstone of the district. The style of the architecture of the new building is English Gothic, some portions of its details modelled upon the old priory at Lanercost, to which the living once belonged. At the north-west end there is a square tower, surmounted by pyramidal slate roof. In the tower is the entrance porch, its arched doorway being modelled upon Lanercost architecture. Passing through the porch (which occupies the whole area of the tower), and entering the body of the church, we find a nave about 45 ft. long by 22 ft. broad, with an aisle, divided from the nave by pointed arches resting upon piers; and at the east end is a large chancel, the entrance to which is spanned by another Gothic arch. The capital of one of the piers is composed of a plain moulding, relieved by a band of "dog-tooth;" and the capital of the other is a floral wreath. The chisel marks are left on the piers and the arch-stones. The aisle occupies the breadth of one side of the tower, and has a curved open timber roof. The roof of the rest of the building is also of open woodwork, but there is no varnish or polish upon any of the beams or timbers. The same remark applies to the seats throughout the church. The chancel fittings are of oak, and the sittings in the body of the church are of pitch-pine. There is a sexfoil window with three lancet windows beneath it, at the west end; along the south side of the nave there are three single lancet windows, and one couplet with a quatrefoil above it; in the nave there are small lancet windows with inner arches, after the style of Lanercost Priory; and in the east end there is a triplet window filled with stained glass (by Mr. Wales, of Newcastle), and there are also side lights. The windows are all splayed, and the rough-hewn stone is shown, the quoins only being chiselled. The walls are plastered. The history of the stained-glass window was this. The site of the old church not being sufficiently large for the new building, and there being no other way of enlarging it except by building over the family vault of the Walton House family, it was arranged that the graves of the Johnsons should be enclosed in the chancel of the new church, with brass tablets to mark them, and the east window was filled with stained glass as a family memorial. The pulpit is of wood, carved; the lectern is plain. The vestry is at the north-east, cut off by a wooden screen; and within the communion-rails there are sedilia for the officiating minister. The mason work was done by Messrs. James Ferguson & Sons, of Great Orton; and Mr. Rutherford, of Brampton, did the carpenter's work. The cost has been about 2,000*l.*

*Carmarthen.*—The new church in Lammas-street, Carmarthen, has been consecrated by the Bishop of St. David's. The church is intended as a chapel of ease to St. David's. The new building was commenced in June, 1867, upon plans drawn up by Mr. R. K. Penson, of Ludlow, architect. The building work was tendered for, and the tender of Mr. D. M. Williams, of Carmarthen, was accepted, the amount of his contract being 3,028*l.*, the total cost 3,600*l.* The ceremony of laying the foundation stone was performed on the 3rd of September, 1867, by the Worshipful Master of the local Masonic Club. The architecture of the church is mixed, the Gothic, however, predominating. It consists of a nave, south aisle, north transept, chancel, and a tower over the chancel. The dimensions are:—nave, 78 ft. by 27 ft. 6 in.; south aisle, 78 ft. by 22 ft. 6 in.; chancel, 41 ft. 6 in. by 25 ft. The height to the top of the wall plate, is 22 ft., and to the ridge of the roof 43 ft. The tower is 94 ft. high, and has a sharp pointed roof with ornamented iron crest, surmounted by three crosses. The chief material used is hammer-dressed local stone, with facings of Bath stone. The windows, nineteen in number, are filled with cathedral tinted glass. The roof is an open one, laid with ornamental slates, the inside being of pine, stained and varnished. All the fittings of the interior are of stained and varnished pine. The pews are open, without doors. The nave, aisle, and transept are laid with Broseley ornamental tiles, and the chancel with encaustic tiles. The gas-fittings will consist of brass coronæ round the columns. The number of sittings is 630. The ground around the church is to be laid out and planted; and when the funds permit the temporary wall now enclosing the ground will be superseded by ornamental railings. The sum required for the whole work is 3,600*l.*, of which 3,000*l.* have been subscribed.

## Books Received.

The "Transactions of the Manchester Statistical Society," 1868-69, just now published, include some interesting papers, especially one "On Vagrants and Tramps," by Mr. T. Barwick Baker. Mr. Baker thus sums up his remarks,—

"If, then, I am asked how to make vagrancy cease as a trade, I should say,—1st. Give sufficient food to all who apply; let there be no dirt, no bullying, nothing that can be alleged as a grievance. 2nd. Make it known to the public that such is the case, and beg them not to give. 3rd. Use the ticket system; not as a magical spell, but as a means of relieving from task work those who travel fairly in order, that you may justly enforce a harder task on such as are not travelling straight at their best pace. 4. Urge the transference of vagrants from the Poor Law and workhouse to the police and County rate, so as to get a thoroughly uniform action. 5th. Then build vagrant wards at the police stations, with separate rooms—I should rather prefer the Witney plans to those at Oswestry, as less expensive. And 6th. When you have made the vagrant wards decent, with sufficient food, punish sharply all beggars."

——*The Illustrated Midland News*, published in Birmingham, has begun very fairly. The difficulty will be to preserve the characteristic on which it is founded, and to prevent it from becoming simply an imitation of the *London Illustrated News*.

## Miscellanea.

**Minerals and Metals.**—There will shortly be published an account of the geological survey of Great Britain and the mineral statistics of the United Kingdom for 1868, which has been prepared by Mr. Robert Hunt, the keeper of the mining records. In a preliminary notice, signed by Sir Roderick Murchison, it is stated that there has been a falling-off in the quantity of coal produced, arising, doubtless, from the long-continued commercial depression, and in regard to the carriage of coal the tonnage has diminished. The production of ores from the British mines does not exhibit any material variation. The following is the quantity of minerals raised in 1868:—Coal, 103,141,157 tons; iron ore, 10,169,231; tin ore, 13,953; copper ore, 157,335; lead ore, 95,236; zinc ore, 12,781; iron pyrites (sulphur ores), 76,484; gold quartz, 1,191; arsenic, 3,300; gossans and ochres, 6,692; wolfram, 9; fluor spar, 60; manganese, 1,700; barytes, 14,235; coprolites, 37,500; salt, 1,513,840; clays, fine and fire, 1,012,479. The total value is 33,837,858*l.* The quantity of metals obtained from the ores enumerated is,—Iron (pig), 4,970,206 tons; tin, 9,300; copper, 9,817; lead, 71,017; zinc, 3,713; silver, 835,542 ounces; gold, 1,012. The money value is 15,736,416*l.*

**The Canterbury Water Supply.**—A report from Mr. S. C. Homersham, the engineer to the local waterworks, as to the new works at Wincheap, has been printed, together with the report of an analysis of the water by Mr. D. Campbell, analytical chemist to the Brompton Hospital. The water is got from the chalk hills at Wincheap, through a bore hole sunk for the purpose. It is hard when pumped up from the subterranean springs, but, subjected to the lime process of Mr. Clark, of Aberdeen, it becomes soft almost as rain-water, and is perfectly pure and free from organic taint. It is to be conducted through pipes in the ground to covered reservoirs, whence a constant supply will be given to the town without need for cisterns. The works are nearly completed.

**Halfpenny Card Postage.**—The authorities at the General Post-office have recently had brought under their notice a system of card postage, which has been tried, it is believed successfully, in Germany. At first sight, a penny-postage seems cheap enough, and the trouble of folding up a letter and putting it into an envelope may be looked upon as infinitesimal. But those who conduct large businesses can tell a very different tale. On the other hand, so far from decreasing the receipts from Post-office traffic, it would tend rather to increase them, while diminishing materially the bulk and weight of the mails. The system would be simply this:—Cards would be provided of a standard size by the Post-office, having, in one corner, as an integral part of the card, a triangular stamp. These cards would be sold by the Post-office in packets, just as stamped envelopes are sold now, at the rate of one halfpenny for each stamp. A trifling addition might be made to the charge, to meet the expense of providing the card itself; but probably this would be unnecessary. One side of these cards would be appropriated to the note or writing to be sent, and the other side to the address, and these cards would pass through the post-office and be delivered in the ordinary way.

**Albert Park, Middlesbrough.**—The fountain which has for some time past been in course of construction in the centre of this park is just completed, and arrangements are being made for its inauguration. It stands on the central plot of ground at the junction of the two main walks. The basin is 90 ft. in circumference, being enclosed in a circle of grey granite, and lined at the bottom in whitewash and cement. The foundation of the fountain is masked by large blocks of freestone, dispersed so as to give a natural effect. The fountain rises in four stages, including the single pinnacle at the top, so that the water will have four distinct falls into and from these intercepting shelves of increasing size into the basin below. These circular shelves are ornamented, especially the lower one, which shows a fringe of lilies resting on the leaves, all painted in imitation of nature. Four cranes and four swans in colours support the two upper shelves respectively. It is questionable whether such ornamentation will stand the weather, coupled with the effect of Tees water conveyed in iron pipes.

**The New Workhouse, Westbury-on-Severn.**—The guardians of this union, having for some time past found the accommodation afforded by their house wholly inadequate for the increasing population of the various parishes comprised within their district (which includes a portion of the Forest of Dean), lately determined to erect what in fact amounts to an entirely new workhouse. With this view they consulted Mr. Alfred W. Maberly, of Gloucester and London, architect; and his plans having been approved by the Poor-law Board, the contract was let to Messrs. James Coleman & Son, of Chaxhill, builders, who are proceeding rapidly with the work. The new buildings comprise a large dining-hall, with chapel over, ascended by staircases, day-rooms and dormitories for the aged and infirm and able-bodied of both sexes, and for boys and girls, with schoolrooms, lavatories, &c. Attached are work-rooms, washhouses, laundries, sheds for out-door labour, with all other necessary rooms required in a building of the kind. The old workhouse will be converted into an infirmary, wards for infectious diseases, &c. It is expected that the new house will be ready for occupation during the coming year.

**The Wolf Rock Lighthouse and the Storms.**—The masonry of the lighthouse being complete, a staff of eight men were placed on the rock to fit up the doors, windows, and lantern. The door, as already noticed in our columns, is of brass, and weighs 13 cwt., yet it opens and shuts with ease, and fits so as to exclude every drop of water: the framework of the windows and of the lantern is proportionately strong and requires to be nicely fitted. On Wednesday, the 8th, the men were all well, and had an ample stock of provisions, enough to withstand a blockade of several weeks. On the 10th and 11th the sea rose, and soon broke clean over this exposed rock, so that the top of the lighthouse had to be securely battened over, and the door and windows closed. The eight men had to make themselves close prisoners. Gales and tremendous seas have since unavailingly assailed the lighthouse.

**Fall of a House, Clifton.**—On Monday morning last, soon after half-past seven o'clock, an accident of a very alarming character, attended by severe injuries to six workmen, occurred at the Queen's-road, Clifton. A series of dwelling-houses and shops, called the "Royal Promenade," are in course of erection between the points at present occupied by the Rifle Drill-hall and the Queen's Hotel. The disaster occurred by the sudden collapse and tumbling down of a considerable portion of the side wall of one of the unfinished houses nearest Clifton. The wall was of considerable thickness, and, falling outwards, buried six of the workmen who were on the spot. It is feared that one will not survive, and that probably another case will prove fatal. The workmen at the place assign the accident to two causes. According to some of them the wall had been raised too rapidly, portions being set upon other portions before there had been sufficient time for the parts to dry. Others considered that the mortar used was not sufficiently good.

**Inauguration of Statues at St. George's Hall, Liverpool.**—A statue of Lord Derby, executed in Carrara marble, by Mr. Theed, of London, has been publicly inaugurated in the large hall of St. George's Hall, Liverpool. The statue has been provided by the Liverpool corporation, at an expense of 1,000*l.*, in consideration of Lord Derby's gift to the town of the Derby Museum, his eminent qualities as a statesman, orator, and scholar, and his connexion with the county. The statue is of the heroic size, and has occupied the artist two years in its execution. It represents Lord Derby in the robes of a Knight of the Garter. On the same occasion there was also inaugurated the statue, in Carrara marble, by Fontana, of Mr. Joseph Mayer, of Liverpool, who is well known in the scientific world, and who recently bequeathed to the town his museum of historical art, valued at 60,000*l.*, and comprising the Faussett collection of Anglo-Saxon antiquities, the Pulsky collection of ivory and other gems, and a large variety of Egyptian remains. This statue is also of the heroic size.

**Machine-made Bricks.**—Until the present time a rule has been in force, owing, we believe, to an understanding between the trade societies of bricklayers and brickmakers, by which none but hand-made bricks were admitted into Manchester. The prohibition also extended to bricks which had been manufactured beyond a certain distance from the city. The existing strike has been the means of inaugurating a new state of things. A company known as the Fairy-lane (Bury New-road) Brick Company has been established for the manufacture of machine-made bricks; and on Tuesday morning the master builders celebrated their triumph in this matter by a demonstration. A hundred carts, laden with bricks from Fairy-lane, and owned by different contractors now engaged upon works in the city, passed in procession to Albert Square, where they halted for a few minutes. They were afterwards taken to the various buildings on which they were to be employed. A considerable proportion of the bricks manufactured by the company will be used in the erection of the new Town-hall.—*Manchester Guardian.*

**Opening of the York Institute Art Exhibition and Fancy Fair.**—An art exhibition has been opened in the lecture-hall of the York Institute, with the view of popularizing the institute and clearing it from debt, as well as improving the taste of the working classes and the citizens generally. The exhibition, which it is proposed shall remain open for at least one month, comprises, in numerous sections, a collection of paintings by old masters and modern artists, water-colour drawings, engravings, chromolithographs and photographs, busts, statuary, articles of *vertu*, literary and historical autographs, ancient costumes and armour, old china and earthenware, coins, metal and leather work, wood carvings and various models, artificial flowers, ornaments, stuffed birds and animals, scientific apparatus, geological specimens, &c.

**Presentation.**—Some difficult alterations having been completed at Thogmorton-chambers, the successful termination of the work was celebrated by a dinner, on which occasion the architect (Mr. C. N. McIntyre North) was presented by his client with a timepiece, as a mark of approval. The contractors were Messrs. Newman & Mann, of Peter's-hill; and Mr. Waller, of Fish-street-hill.

**The Proposed Wet Dock at Whitehaven.**—At a special meeting of Whitehaven Town and Harbour Trustees, Mr. Stiven, the harbour engineer, laid before the trustees a plan for the construction of a wet dock in the harbour of Whitehaven. The situation of the proposed dock is thus described in Mr. Stiven's report:—One of the dock walls will run parallel with Tangier-street. The length of this wall will be 570 ft. The wall at the west end of the dock will be 330 ft. long, and intersects the bulwark. The front wall across the north harbour will be 560 ft. in length, and 70 ft. in width. Through this wall, and adjoining the present north wall, will be placed the dock entrance-gate, 50 ft. in width. The wall at the east end of the dock will be 360 ft. long. The area of water space will be nearly four acres and a half. The meeting received the report, and resolved that it be printed and circulated, and that Mr. Stiven prepare an estimate of the cost and the probable time that would be required to carry out his plan.

**An Arminian Church in England.**—A religious service of a very unusual character was performed at Chorlton-on-Medlock on Friday week—the laying of the foundation stone of the first Arminian Church in England. The officiating priest wore a magnificent blue cope, richly trimmed with gold fringe. The foundation stones, sixteen in number, were blessed on the previous Sunday. Each stone is dedicated to one of the apostles and fathers of the Church, and has its special place assigned according to the Arminian rubric, in the foundations. During the ceremony the priest held in his hand a gold cross, and read from a richly-bound missal the psalms and other prayers arranged for the service. An acolyte carried the stones, which are about 2 in. long, in a bag, each one folded in a white linen cloth, with the saint's name inscribed upon it. Small holes were cut in the foundation to receive the stones, which were deposited at each corner.

**Restoration of St. David's Cathedral.**—The building committee held a meeting at Carmarthen a few days ago, the Lord Bishop in the chair, when a financial report was read. It appears that, including 10,000*l.* given by the Ecclesiastical Commissioners, about 21,000*l.* are available; and that about 18,000*l.* have been already spent. Mr. Gilbert Scott, the architect, reported upon the works already executed by Messrs. Wood & Sons, and made a rough estimate of what it would cost to repair and restore thoroughly the remaining portion of the interior, the roofs, and external walls—viz., about 11,000*l.* Mr. Scott is to report to a future meeting, and an appeal for further subscriptions is to be made.

**Earthquakes in France and Elsewhere.** On September 11th, at 5·5 a.m., a violent shock of earthquake took place at Bagnères-de-Bigorre, spreading in the direction of Barèges, Luz, and Saint Sauveur. The noise was similar to the rolling of distant thunder, and was terminated by an explosion such as would be caused by the falling in of some cavern. At Bagnères several persons thought that their houses were falling down, and got out of bed to rush abroad. At Saint Sauveur, a lady passenger in the diligence between Luz and Barèges felt the ground undulate under her feet at the same time; the earthquake roll was, as usual, like a cart rolling over a paved street. There have also been earthquakes at the Isle of St. Thomas and in South America.

**The Baronetcies of Mr. Whitworth and Mr. Fairbairn.**—It is stated that Mr. Whitworth and Mr. William Fairbairn have accepted the baronetcies which have been offered to them by Mr. Gladstone. Mr. Whitworth's name will, perhaps, be remembered more by the improvements which he has made in the construction of tools than by the rifle which bears his name; and Mr. Fairbairn's discoveries in metallurgy, adding, as they have done, to the material wealth of the country, abundantly entitle him to such honour as the Government has to bestow. Both of the new baronets have risen from the workman's bench.

**Working Men's College.**—The sixteenth session of this college will commence on Monday, October 25, when the principal, the Rev. F. D. Maurice, M.A., Professor of Moral Philosophy at Cambridge, will deliver the inaugural address. Six new class-rooms are now in course of erection, at an estimated cost of about 2,000*l.*; of this sum about 400*l.* are still required.

**Banbury Church Plans.**—The adjourned meeting, with the view of applying for a faculty to carry out the plans that had been submitted for a new chancel, was held last week, and as the proposers, very unwisely, as it seems to us, would make no concession whatever as to the seven steps up to the communion-table, the opposition shown continued to be so strong that the vicar and his friends withdrew the plans. All the opposition said was, do without two or three of the steps: surely a small concession to make. Salvation does not depend on such steps as these.

**Lamplighting by Electricity.**—Mr. Hart, an experienced electrician, has propounded a scheme for lighting up all the street lamps in Edinburgh at once from an electric battery. The saving of gas alone, without taking the other savings on ladders and lamp-lighters into account, is said to show a figure beyond the expenses of the simple lighting power. The proposal to light lamps by electricity is not a new one, as old volumes of the *Builder* can testify.

**Shoreditch New Town-hall.**—The ventilating tubes of the sun-burners were placed so near to the woodwork, notwithstanding the provisions of the Building Act, that an accident was feared. The suggestions of several practical men have been taken on the matter, and the vestry resolved to accept the tender of Messrs. Strode & Co., who undertake to construct additional shafts of ventilation and other improvements for the sum of 46*l*.

**The Female Art Gallery.**—A bazaar is being got up for the sale of works of art executed by female artists, the proceeds of which will be devoted to the Female Art Gallery, in Great Russell-street, Bloomsbury-square. The bazaar is to be opened for five days, and close on Christmas Eve. Those who desire to encourage female art can become subscribers to this gallery.

**The Proposed New College at Rotherham.**—We are glad (says the *Sheffield Independent*) to be able to announce that a site has at length been obtained for the College, which is intended to supersede the present one at Rotherham. The committee have succeeded in purchasing 8½ acres of land at Moorgate, near the residence of Mr. Jubb.

**Preliminary Opening of the Suez Canal.**—M. de Lesseps, it is reported by telegram, has passed through the whole length of the Suez Canal in fifteen hours, by steamer, the barriers which obstructed the passage of the water into the Bitter Lakes having been removed.

**Bequest for Chapels and Schools.**—Mrs. Burton, who died recently at Roundhay, near Leeds, has left some large bequests for charitable purposes. The total amount of her benefactions exceeds 30,000*l*., of which 15,000*l*. are to be devoted to the erection of Wesleyan chapels and schools in Cumberland and Scotland.

**The Expected High Tides.**—Consequent on the report of the high tides expected next month large numbers of persons residing in houses on the banks of the Thames are taking measures to prevent the water entering their dwellings.

**Great Fire in Bordeaux Harbour.**—Between twenty and thirty large vessels have been destroyed by fire in Bordeaux harbour. The fire originated in a lighter loaded with petroleum.

## TENDERS.

For building a warehouse, 28, St. Mary Axe, E.C. Mr. H. H. Collins, architect:—

| | |
|---|---|
| Abrahams | £936 0 0 |
| Ebbs & Sons | 788 0 0 |
| Sale | 786 0 0 |
| Cohen (accepted) | 750 0 0 |

For building warehouse, 29, St. Mary Axe. Mr. H. H. Collins, architect:—

| | |
|---|---|
| Abrahams | £642 0 0 |
| Sale | 605 0 0 |
| Ebbs & Son | 602 0 0 |
| Cohen | 541 0 0 |

For building stables, Stratford-mews, Oxford-street. Mr. H. H. Collins, architect:—

| | |
|---|---|
| Ebbs & Sons (accepted) | £495 0 0 |

For alterations and additions to stables, Wimpole-street, Cavendish-square. Mr. H. H. Collins, architect:—

| | |
|---|---|
| Ebbs & Sons | £345 0 0 |
| Cohen | 320 0 0 |
| Sale (accepted) | 297 0 0 |

For building Mortuary Hall, Lodge, and enclosing walls for Hebrew Congregation, Witton, Birmingham. Mr. H. H. Collins, architect. Quantities supplied by Messrs. Batstone & Hunt:—

| | |
|---|---|
| Webb | £3,014 0 0 |
| Waden & Sons | 2,968 0 0 |
| Matthews | 2,890 0 0 |
| Partridge | 2,810 0 0 |
| Cresswell & Sons | 2,696 0 0 |
| Barnsley | 2,493 0 0 |

For the erection of a villa residence, in the King's-road, Buckhurst Hill, for Mr. S. P. Willament. Messrs. Hills & Fletcher, architects:—

| | |
|---|---|
| Alexander | £735 0 0 |
| Wicks & Bangs | 730 0 0 |
| Sheffield | 693 0 0 |
| Stevens | 658 0 0 |
| Egan | 650 0 0 |
| Grover | 648 0 0 |

For a bridge at Ruislip, Middlesex. Mr. G. Eves' architect:—

| | |
|---|---|
| White | £207 2 0 |
| Henson | 206 10 0 |
| Cox (accepted) | 82 0 0! |

For erecting show-rooms and offices for the City of London Real Property Company, Limited, at 25, Mincing-lane, City. Mr. Edwin A. B. Crockett, architect:—

| | |
|---|---|
| Gammon & Sons | £3,890 0 0 |
| Myers & Son | 2,536 0 0 |
| Clemence | 2,395 0 0 |
| Newman & Mann | 2,335 0 0 |
| Patman & Fotheringham | 2,230 0 0 |
| Macey | 2,189 0 0 |
| Ashby & Son | 2,149 0 0 |
| Brass | 2,044 0 0 |
| Conder | 1,995 0 0 |

For works at Philip-street, Kingsland. Mr. W. Mundy, architect:—

| | |
|---|---|
| F. & F. J. Wood | £350 0 0 |
| King & Sons | 349 0 0 |
| Marr | 338 0 0 |
| Blackmore & Morley (accepted) | 299 0 0 |

For works at 337, Goswell-road. Mr. W. Mundy, architect:—

| | |
|---|---|
| Peters | £153 0 0 |
| Higgs | 147 0 0 |
| Marr | 140 0 0 |
| Langmead | 136 0 0 |
| Blackmore & Morley | 128 10 0 |
| Beales | 112 10 0 |

For works at "Old Blue Last," Curtain-road, Shoreditch, for Messrs. Truman, Hanbury, & Buxton. Mr. W. E. Williams, architect:—

| | |
|---|---|
| Anley | £820 0 0 |
| Fairhall & Weekes | 750 0 0 |
| Marr (accepted) | 725 0 0 |

For construction of sewage tank and engine-house, for the Epsom Local Board of Health. Mr. W. Scarlett Trehearne, architect:—

| | |
|---|---|
| Coker | £800 0 0 |
| Walton | 799 0 0 |
| Clarke | 774 0 0 |
| Chuter | 754 0 0 |
| Doggett | 720 0 0 |
| Farley | 715 0 0 |
| Paice | 700 0 0 |
| Spearing & Moy | 677 0 0 |
| Crabb & Vaughan | 667 0 0 |
| Appleby | 657 0 0 |
| Coker (accepted) | 633 10 0 |

For the erection of St. Luke's Church, Halliwell, Lancashire. Medland & Henry Taylor, architects:—

| | |
|---|---|
| Middlehurst | £5,200 0 0 |
| Clark | 4,968 0 0 |
| Ellis & Hinchliffe | 4,392 0 0 |
| Foggett | 4,344 0 0 |
| Robinson & Son (accepted) | 4,234 0 0 |

For new Cattle Market, Melton Mowbray. Mr. R. W. Johnson, architect:—

*No. 1 Contract, for Excavators, Roadmakers, and Builders' Work.*

| | |
|---|---|
| Lee & Alderson | £4,250 0 0 |
| J. & G. Tomlinson | 3,790 0 0 |
| Smart & Co. | 3,750 0 0 |
| Herbert | 3,746 0 0 |
| Fast | 3,600 0 0 |
| Walker & Co. | 3,588 0 0 |
| Thompson | 3,585 0 0 |
| Weaver | 3,488 14 6 |

*No. 2 Contract, for Cast and Wrought Ironwork.*

| | |
|---|---|
| Hill & Smith | 1,273 15 0 |
| Jukes, Colson, & Co. | 1,179 0 0 |
| Law | 1,150 0 0 |
| Ratcliffe & Co. | 1,115 0 0 |
| Gimson | 1,107 0 0 |
| Haywood | 1,085 0 0 |
| Thompson | 1,085 0 0 |
| Sharman | 1,063 0 0 |
| Mellard | 1,048 0 0 |
| Cooke | 986 0 0 |
| Fast | 970 0 0 |
| Southwell & Co. | 965 0 0 |
| Richards | 909 0 0 |

For new Infirmary and other alterations at Melton Mowbray Union Workhouse. Mr. R. W. Johnson, architect:—

| | |
|---|---|
| Weaver & Barnes | £2,246 10 0 |
| Thompson | 2,119 0 0 |
| Halliday & Cane | 2,082 0 0 |
| Osborne Brothers | 2,080 0 0 |
| Shipley | 2,050 0 0 |
| Johnson | 2,024 0 0 |
| Herbert | 1,999 10 0 |
| Neale & Sons | 1,940 0 0 |
| Fast | 1,930 0 0 |

For alteration to factory at Kettering, North Hants. Mr. R. W. Johnson, architect:—

| | |
|---|---|
| Sharman | £473 0 0 |
| Margetts | 466 0 0 |
| Wilson | 460 0 0 |
| Hawthorn | 407 0 0 |
| Barlow & Melton | 381 0 0 |

For alterations and additions to Craven Lodge, Melton Mowbray. Mr. R. W. Johnson, architect:—

*At House and Offices.*

| | |
|---|---|
| Neale & Sons | £775 0 0 |
| Herbert | 750 0 0 |
| Fast | 732 10 0 |

*At Stables.*

| | |
|---|---|
| Herbert | 986 0 0 |
| Neale & Sons | 950 0 0 |
| Fast | 946 0 0 |

For house in Mansion House-street, Hammersmith, for Mr. C. Bawn. Mr. W. L. Gomme, architect:—

| | |
|---|---|
| Sprinks | £462 0 0 |
| Braithwaite | 379 0 0 |
| Coombe | 369 0 0 |
| Chamberlin Brothers (accepted) | 339 0 0 |
| Richardson | 346 0 0 |

For two houses in Regent-street, Bow, for Mr. Hays. Mr. W. L. Gomme, architect:—

| | |
|---|---|
| Sprinks (accepted) | £550 0 0 |

For villa residence at Dresden, for Mr. W. Copestake. Messrs. Scrivener & Son, architects. Quantities supplied:—

| | |
|---|---|
| Newbon | £758 0 0 |
| Collis & Hudson | 718 0 0 |
| Harvey (accepted) | 709 0 0 |
| Redman | 682 0 0 |

For villa, Shelton Hall Estate, Hanley, for Mr. J. Mountford. Messrs. Scrivener & Son, architects. Quantities supplied:—

| | |
|---|---|
| Brindley & Critchlow | £850 0 0 |
| Bennett & Cooke | 846 0 0 |
| Wooldridge (accepted) | 825 0 0 |
| Bowden | 824 0 0 |
| Barlow | 790 0 0 |

For shop and premises, Stafford-street, Hanley, for Mr. Boult. Messrs. Scrivener & Son, architects. Quantities supplied:—

| | |
|---|---|
| Brindley & Critchlow | £580 0 0 |
| Matthews | 559 0 0 |
| Barlow | 556 0 0 |
| Bowden (accepted) | 555 10 0 |

For limekilns, Hanley, for Mr. J. C. Daniel. Messrs. Scrivener & Son, architects. Quantities supplied:—

| | |
|---|---|
| Redfern Brothers | £350 0 0 |

For three cottages, Tinkersclough, for Mr. Frost. Messrs. Scrivener & Son, architects. Quantities supplied:—

| | |
|---|---|
| Bryant | £384 0 0 |
| R. Hammersley (accepted) | 330 0 0 |

For fixtures, Queen's Hotel, Hanley. Messrs. Scrivener & Son, architects. Quantities supplied:—

| | |
|---|---|
| J. Hammersley | £359 0 0 |
| R. Hammersley (accepted) | 345 0 0 |

For additions to brewery, Burslem, for Mr. H. Parker. Messrs. Scrivener & Son, architects. Quantities supplied:—

| | |
|---|---|
| Walley | £745 0 0 |
| Watkin | 715 0 0 |
| Barlow (accepted) | 697 0 0 |
| Bennett & Cooke | 660 0 0 |

*For Ironwork for the above.*

| | |
|---|---|
| Warner | £131 19 6 |
| Railway Foundry Company | 125 13 2 |
| Hales | 118 0 0 |
| Barker & Cope | 117 18 4 |
| North Staffordshire Engineering Company (accepted) | 114 4 11 |

For villa residence at Erith, Kent. Mr. Herbert Ford, architect. Quantities not supplied:—

| | |
|---|---|
| Gorrum | £2,110 0 0 |
| Crabb & Vaughan | 2,103 0 0 |
| Rayner | 2,089 0 0 |
| Cooke & Green | 2,071 0 0 |
| Harrison & Sons | 1,990 0 0 |
| Harrison & Edwards | 1,964 0 0 |
| Lidbetter | 1,900 0 0 |
| Davis | 1,899 0 0 |
| Hearle | 1,889 0 0 |
| Vaughan | 1,880 0 0 |
| Blackmore & Morley | 1,785 0 0 |
| Turner | 1,730 0 0 |
| Willis | 1,689 0 0 |
| Blease (accepted) | 1,393 0 0 |

*Houses, Church-street, Blackfriars.*—It is stated, on the part of Mr. Cohen, one of the tenderers, that he did not receive any quantities from Mr. Shrubsole.

## TO CORRESPONDENTS.

J. D. P. (*Italia*).—G. J. (such a scheme for crossing the Channel has already been proposed with great minuteness by Mr. Bateman, C.E.).—J. M. B. & Sons (Mr. Shrubsole asserts that he took out the quantities).—J. B. H.—E. A. C.—J. N.—H.—Mr. E.—R. S.—K. C.—W. L. C.—J. J. O.—R. N. S.—R. A.—Private.—J. F. T.—J. W. F.—Mr. G.—W. G. L.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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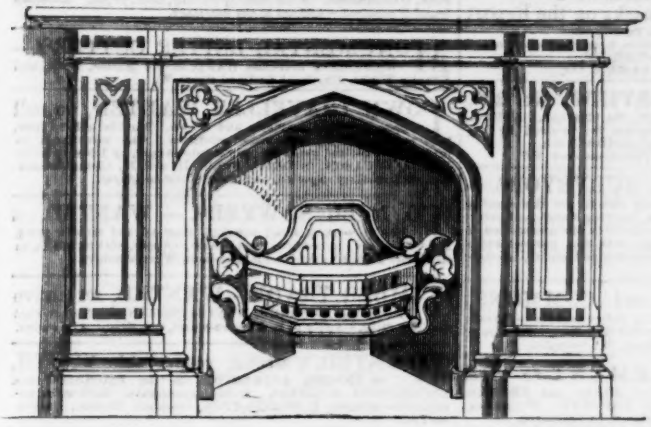

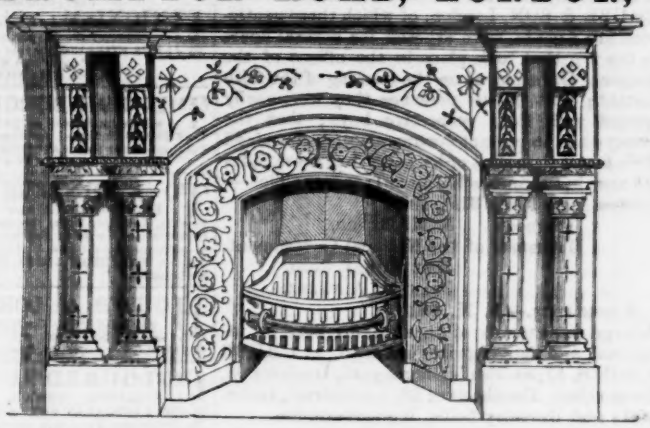

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| BLANC P. | ITALIAN GRIOTTE | ROSE DE CASTILLE | BARDILLA | ST. ANNE |
| VEIN | BROCATELLE | SARANOLIN | NAPOLEON | BLUE BELGE |
| SICILIAN | JAUNE LAMARTINE | LANGUEDOC | MALPLAQUET | ROUGE ROYAL |
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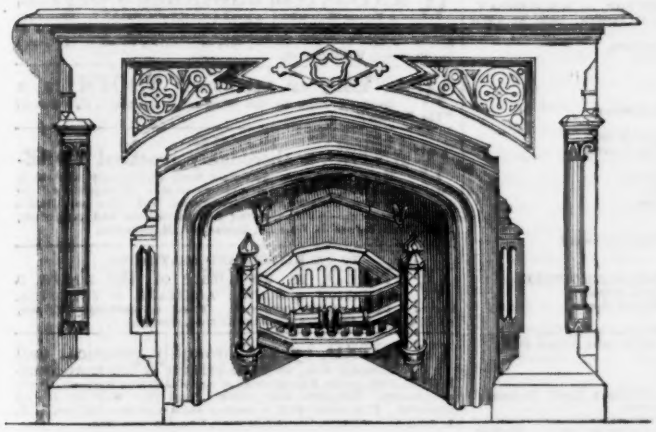

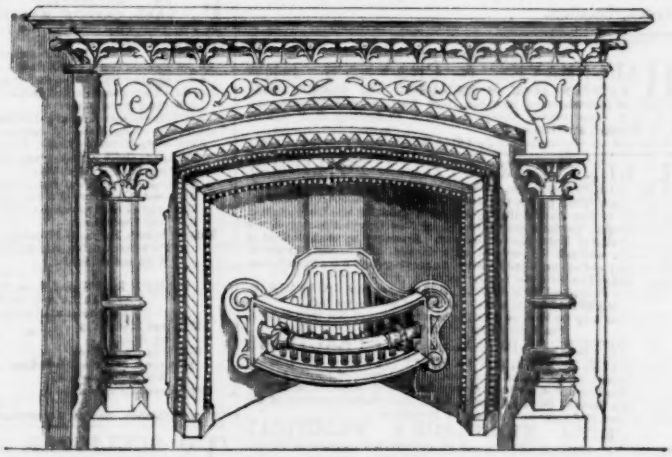

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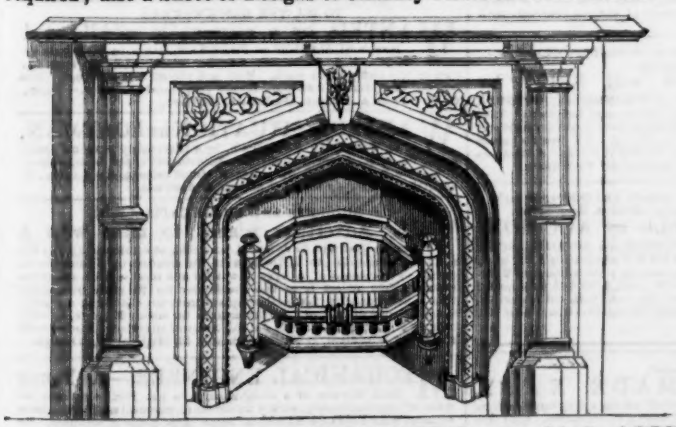

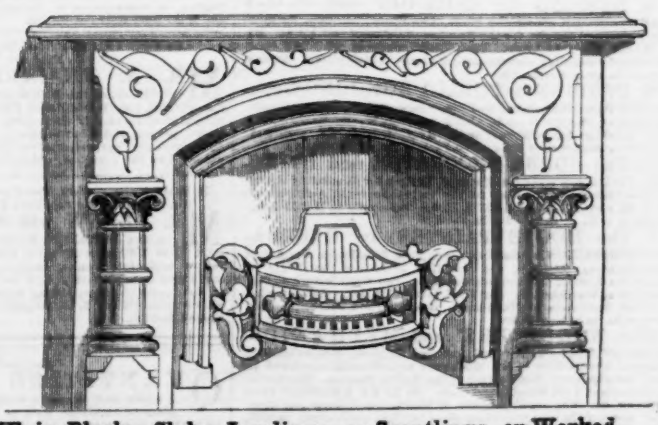

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(Signed) J. M. DRAGO,
Treasurer of the National Government.
JOSE TOMAS ROJO.
JUAN M. ALVAREZ.

A true copy.—A. M. BELL."

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